PROJECT MANUAL

GOVERNOR'S OFFICE

GOVERNMENT HOUSE ANNEX BUILD OUT

NO. 19A & 20 KONGENS GADE, CHARLOTTE AMALIE
ST. THOMAS, UNITED STATES VIRGIN ISLANDS 00802

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FOR

Honorable Albert Bryan, Governor
GOVERNMENT OF THE VIRGIN ISLANDS
21-22 KONGENS GADE
CHARLOTTE AMALIE, ST. THOMAS
UNITED STATES VIRGIN ISLANDS 00802

SECTION 0 – INDEX

GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19A & 20 KONGENS GADE, ST.THOMAS, UNITED STATES VIRGIN ISLANDS

SECTION 01000 - SUMMARY

GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19A & 20 KONGENS GADE, ST. THOMAS, UNITED STATES VIRGIN ISLANDS

PART 1 GENERAL

1.1 PROJECT

A. Project Name:
GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19 & 20 KONGENS GADE, ST. THOMAS, UNITED STATES VIRGIN ISLANDS

B. Owner's Name:
VIRGIN ISLANDS GOVERNMENT, GOVERNOR'S OFFICE

C. Plan Designer's Name:
The U.S. Virgin Islands Department of Public Works

D. The complete Project consists of the renovation of build out of the Governor's Office Annex Building. This construction shall include: construction of walls, bricking in windows to prevent water infiltration, sealing around windows to stop windblown rain infiltration, reinstating HVAC returns, reestablishing boxes for electrical and the communications system, establishing a fire alarm and sprinkler system, ceilings, door trim, base and ceiling molding.

E. Owner will remove the following items before start of work:

1. Furniture and storage room materials.

1.2 SALVAGE BY CONTRACTOR

A. Contractor shall remove and store the following, for later reinstallation by Contractor, prior to start of work:

1. N. A.

1.3 WORK BY OTHERS

A. N.A.

1.4 OWNER FURNISHED PRODUCTS

A. Products furnished by Owner include the following categories:

1. OFCI:
Owner furnished Contractor installed.

2. OFCR:
Owner furnished Contractor rough-in:

3. OFOI:
Owner furnished Owner Installed.

B. Owner Responsibilities for products in the following category:
OFCI

1. Arrange installation inspections required by regulatory agencies having jurisdiction.

C. Contractor's Responsibilities (for all categories unless otherwise noted): OFCR;

1. Coordinate installation of Owner furnished products with other portions of the Work.

2. Designate submittal and delivery date for each product affecting construction schedule.

3. Review submittals of Owner furnished products and verify rough-in requirements prior to installation for products in the following categories:

a. OFCI

b. OFCR

4. Notify Owner's Representative of discrepancies that would affect installation and rough-ins.

5. Promptly inspect products jointly with the Owner, record shortages, damaged or defective products listed in the following categories:

a. OFCI

6. Protect products from damage after installation.

a. The sink, toilet, and the cabinetry in the Rest Rooms are to remain.

7. Assemble, install connect, adjust, test and calibrate, and finish products listed in the following category:

b. OFCI.

8. Provide mechanical, plumbing and electrical connections to Contractor installed products including installation of service fixtures for products listed in the following categories:

a. OFCR

b. OFCI.

9. Afford Owner's forces a reasonable opportunity for delivery and storage of their products and the execution of their work. Where required, Construction Manager shall properly connect his work to that installed by the Owner's forces.

10. Repair or replace items damaged by Construction Manager.

11. Receive and unload products at the site for products listed in the following categories:

a. OFCI

b. OFCR.

12. Handle products at the site, including uncrating and storage for products listed in the following categories:

a. OFCI

b. OFCR.

1.5 CONTRACTOR FURNISHED PRODUCTS

A. Products furnished by Contractor consist of products listed in the following category:

1. CFCI.

B. Contractor's responsibilities:

1. As indicated in the Construction Documents.

1.6 OWNER OCCUPANCY

A. Owner intends to occupy the Project by the date stated in the Agreement as the contract completion date.

B. Cooperate with Adjacent Property Owners to minimize conflict and to facilitate the adjacent Land Owner's operations with the least amount of inconvenience.

C. Contractor shall take precautions to avoid excessive noise or vibration that would disturb Adjacent Property owners' operations. When directed by Owner, Contractor shall perform certain operations at designated time of day or night in order to minimize disturbance to Owner's operations.

D. Schedule the Work to accommodate Owner occupancy.

1.7 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations are limited to areas permitted by Law, Ordinances, Permits and Contract Documents.

B. Arrange use of site and premises to allow:

1. Owner occupancy and operation.

2. Use of adjacent sites by the public.

C. Do not unreasonably encumber site or premises with materials or equipment.

D. Limit use of site and premises for Work and storage as follows:

1. Maintain Owner and public access to existing building, parking, drives and walks at all times.

2. Restrict work and storage to construction areas indicated on Drawings.

3. Existing parking areas may not be used for storage.

4. Access site only as indicated on the Drawings.

5. Restrict parking to areas designated by the Owner.

6. Do not perform operations that would disrupt or delay Owner's daily operations.

7. Restrict construction personnel from access to other areas of the site and existing building, except as required to perform new and alterations work.

E. Assume full responsibility for protection and safekeeping of products stored on premises.

F. Relocate stored products which interfere with operations of Owner.

G. Do not load structure with weight that will endanger structure.

H. Emergency Building/Site Exits during Construction:

1. Keep all existing site exits open during construction period.

2. Provide barricade and signage in accordance with all requirements of the local building authorities during construction.

I. Utility Outages and Shutdown:
To be scheduled with the Owner's representative prior to implementing.

1.8 WORK SEQUENCE

A. Coordinate construction schedule and operations with Owner.

1.9 BID SCHEDULE

A. The Contract Scope is a Unit Price offer to include the entire Scope Of Work described in the Contract Documents. The Contractor shall complete the Bid Schedule included in the Contract Documents and submit it with their bid. The Bid Schedule is representative of a breakdown of major scope items. Items shown in the Contract Documents, but not specifically shown in the Bid Schedule are also included in the Contract Cost.

PART 2 PRODUCTS- NOT USED

PART 3 EXECUTION- NOT USED

END OF SECTION

SECTION 01039-COORDINATION AND MEETINGS

GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19A & 20 KONGENS GADE, ST.THOMAS, UNITED STATES VIRGIN ISLANDS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Coordination and project conditions.

B. Field engineering.

C. Preconstruction meeting.

D. Site mobilization meeting.

E. Progress meeting.

F. Pre-installation meetings.

G. Equipment electrical characteristics and components.

H. Examination.

I. Preparation.

J. Cutting and Patching.

K. Alteration project procedures.

1.2 RELATED SECTIONS (NOT USED)

1.3 COORDINATION AND PROJECT CONDITIONS

A. Coordinate scheduling, submittals, and Work of the various sections of the Specifications to ensure an efficient and orderly sequence of construction elements.

B. Verify all existing utility locations.

1.4 FIELD ENGINEERING

A. Contractor shall locate and protect all survey control and reference points and shall accurately replace and have verified by the Engineer any such point, which is damaged or moved, at his own expense.

B. Control datum for survey is as that shown on Drawings. The survey shall establish certain reference points and benchmarks in the immediate vicinity of the work areas. The Contractor shall lay out all additional lines and grades and otherwise do all layout and measurements necessary for the proper completion of the work.

C. Verify setbacks and easements; confirm drawings dimensions and elevations.

D. Provide field engineering services. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.

E. The Contractor shall furnish assistance to the Engineer as requested to check the layout or otherwise control the work. Such assistance shall be understood to include the provision of suitable manpower to assist the Engineer in taping measurements, holding a survey rod for checking grades and the like.

F. The Engineer reserves the right to inspect or check any of this work, and the Contractor shall not claim added compensation for any delay occasioned by required as a result of the Engineer's inspections.

1.5 PRECONSTRUCTION MEETING

A. Owner will schedule a meeting after Notice of Award.

B. Attendance Required:
Owner, Owner's Construction Representative, Designer, and Contractor.

C. Agenda:

1. Submission of list of testing agency and other parties providing services on the project.

2. Procedures and processing of field decisions, submittals, and substitutions, applications for payments, pricing request, Change Orders, and Contract closeout procedures.

3. Procedures for layout of the project, establishing controls, limits of right-of-way and easements.

4. Scheduling.

D. Contractor will record minutes and distribute copies to participants and those affected by decisions made.

1.6 SITE MOBILIZATION MEETING

A. Owner's Representative may schedule a meeting at the project site prior to construction start-up.

B. Attendance Required:
Owner's Representative/Engineer, Contractor's Superintendent, and major Subcontractors.

C. Agenda:

1. Use of the site by Owner and Contractor.

2. Owner's requirements. Features to remain.

3. Construction facilities provided by Contractor.

4. Temporary utilities provided by Contractor.

5. Security and housekeeping procedures.

6. Schedules.

7. Application for payment procedures.

8. Procedures for testing.

9. Procedures for maintaining record documents.

D. Contractor will record minutes and distribute copies to participants and those affected by decisions made.

1.7 PROGRESS MEETINGS

A. Schedule and administer meetings throughout the progress of the Work at weekly intervals or intervals agreed to by Owner's Representative and Contractor.

B. Owner's Representative will make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.

C. Attendance Required:
Job superintendent, major Subcontractors suppliers, and Owner's Representative as appropriate to agenda topics for each meeting.

D. Agenda:

1. Review minutes of previous meetings.

2. Review of Work progress.

3. Field observations, problems, and decisions.

4. Identification of problems which impede planned progress.

5. Review of submittals schedule and status of submittals.

6. Review of off-site fabrication and delivery schedules.

7. Maintenance of progress schedule.

8. Corrective measures to regain projected schedule.

9. Planned progress during succeeding work period.

10. Coordination of projected progress.

11. Maintenance of quality and work standards.

12. Effect of proposed changes on progress schedule and coordination.

13. Other business relating to Work.

E. Owner's Representative will record minutes and distribute copies to participants and those affected by decisions made.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for cutting and patching.

B. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1. Requirements of this Section apply to mechanical and electrical installations. Refer to Division-23 and Division-26 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

2. Demolition of selected portions of the building for alterations is included in Section "Selective Demolition."

1.3 SUBMITTALS

A. Cutting and Patching Proposal:
Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:

1. Describe the extent of cutting and patching required and how it is to be performed indicate why it cannot be avoided.

2. Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.

3. List products to be used and firms or entities that will perform Work.

4. Indicate dates when cutting and patching is to be performed.

5. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.

6. Where cutting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.

7. Approval by the Owner/Owner's Representative to proceed with cutting and patching does not waive the Owner/Owner's Representative's right to later require complete removal and replacement of a part of the Work found to be unsatisfactory.

1.4 QUALITY ASSURANCE

A. Requirements for Structural Work:
Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.

1. Obtain approval of the cutting and patching pricing proposal before cutting and patching the following structural elements:

a. Foundation construction

b. Bearing and retaining walls

c. Structural concrete

c. Structural steel

d. Lintels

e. Timber and primary wood framing

f. Miscellaneous structural metals

g. Exterior curtain wall construction

B. Operational and Safety Limitations:
Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.

1. Obtain approval of the cutting and patching pricing proposal before cutting and patching the following operating elements or safety related systems:

a. Shoring, bracing, and sheeting.

b. Water, moisture, or vapor barriers.

c. Membranes and flashings.

d. Electrical wiring systems.

C. Visual Requirements:

Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Owner's Representative's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.

1. If possible, retain the original installer or fabricator to cut and patch the following categories of exposed Work, or if it is not possible to engage the original installer or fabricator, engage another recognized experienced and specialized firm:

   a. Processed concrete finishes

   b. Stonework and stone masonry

   c. Ornamental metal

PART 2 - PRODUCTS

2.1 MATERIALS

A. Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that fully match existing adjacent surfaces possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 - EXECUTION

3.1 INSPECTION

A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.

   1. Before proceeding, meet at the site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.2 PREPARATION

A. Temporary Support:
   Provide temporary support of Work to be cut.

B. Protection:
   Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.3 PERFORMANCE

A. General:
Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

B. Cutting:
Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.

1. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

3. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.

4. Comply with requirements of applicable Sections of Division- 2 where cutting and patching requires excavating and backfilling.

5. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.

C. Patching:
Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.

2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

3.4 CLEANING

A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION

SECTION 01095 – REFERENCE STANDARDS AND DEFINITIONS

GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19A & 20 KONGENS GADE, ST.THOMAS, UNITED STATES VIRGIN ISLANDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division I Specification Sections, apply to this Section.

1.2 DEFINITIONS

A. General:
Basic Contract definitions are included in the Conditions of the Contract.

B. Indicated:
The term indicated refers to graphic representations, notes, or schedules on Drawings, or other Paragraphs of Schedules in the Specifications, and similar requirements in the Contract Documents. Terms such as shown, noted, scheduled, and specified are used to help the reader locate the reference. There is no limitation on location.

C. Directed:
Terms such as directed, requested, authorized, selected, approved, required and permitted mean directed by the Owner's Representative, requested by the Owner's Representative, and similar phrases.

D. Approved:
The term approved, when used in conjunction with the Owner's Representative's action on the Contractor's submittals, applications, and requests, is limited to the Owner's Representative's duties and responsibilities as stated in the Conditions of the Contract.

E. Regulations:
The term regulations include laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

F. Furnish:
The term furnish means supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. Install:
The term describes operations at the Project site including the actual unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, and finishing, curing, protecting, cleaning, and similar operations.

H. Provide:
The term provide means to furnish and install, complete and ready for the intended use.

I. Installer:
An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.

J. Trades:
Using terms such as carpentry is not intended to imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as carpenter. **It** also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.

K. Project site:
The space available to the Contractor for performing construction activities either exclusively or in conjunction with others performing other work as part of the Project. The extent of the Project site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.

L. Testing Agencies:
A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project site or elsewhere, or to reports on and, if required, to interpret results of those inspections or tests.

M. Owner's Representative:
Agent authorized to act on behalf of the Owner.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. Specification Format:
These Specifications are organized into Divisions and Sections based on the Construction Specification Institute's 50 - Division Format and MASTER FORMAT numbering system.

B. Specification Content:
This Specification uses certain conventions regarding the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

1. Abbreviated Language:
Language used in Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words that are implied, but not stated, shall be interpolated as the sense requires. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicate.

2. Imperative and streamlined language is used generally in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subject language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor, or by other means when so noted.

a. The words "shall be" are implied wherever a colon (:) is used within a sentence or phrase.

1.4 INDUSTRY STANDARDS

A. Applicability of Standards:

Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates:
Comply with the standards in effect as of the date of the Contract Documents.

C. Conflicting Requirements:
Where compliance with two or more standard is specified and where the standards may establish different or conflicting requirements for minimum quantities or quality levels, refer requirements that are different but apparently equal and other uncertainties to the Owner's Representative for a decision before proceeding.

3. Minimum Quantity or Quality Levels:
The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the Owner's Representative for a decision before proceeding.

D. Copies of Standards:
Each entity engaged in construction on the project is required to be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source.

E. Abbreviations and Names:
Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-generating organization, authority having jurisdiction, or other entity applicable to the context of the Text provision. Refer to the "Encyclopedia of Associations," published by Gale Research Co., available in most libraries.

1.5 SUBMITTALS

A. Permits, Licenses, and Certificates:
For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence, and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Sum and Contract Time.

C. Change procedures.

D. Procedures for preparation and submittal of application for final payment.

1.2 RELATED SECTIONS: N/A

1.3 SCHEDULE OF VALUES

A. Submit a printed schedule on AIA Form G703 -Application and Certificate for Payment Continuation Sheet.

B. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.

C. Format:
Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification Section. Identify site mobilization, bonds, and insurance, and site demobilization.

D. Revise schedule to list approved Change Orders, with each Application for Payment.

1.4 APPLICATIONS FOR PROGRESS PAYMENT

A. Payment Period:
Submit at intervals stipulated in the Agreement.

B. Present required information as typewritten/computer-generated form.

C. Form:
AIA G702 Application and Certificate for Payment and AIA G703 -Continuation Sheet including continuation sheets when required.

D. For each item, provide a column for listing each of the following:

1. Item Number

2. Description of Work

3. Scheduled Values

4. Previous Applications

5. Work in Place and Stored Materials under this Application

6. Total Completed and Stored to Date of Application

7. Percentage of Completion

8. Balance to Finish

9. Retainage

E. Execute certification by signature of authorized officer.

F. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored Products.

G. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original time of Work.

H. Submit two copies of each Application for Payment.

I. Include the following with the application:

1. Transmittal Letter as specified for Submittals in Section 01300.

2. Construction progress schedule revised and current as specified in Section 01300.

3. Current construction photographs specified in Section 01300.

4. Partial release of liens from major Subcontractors and Vendors.

5. Affidavits attesting to off-site stored products.

J. When Owner's Representative requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of date with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.5 MODIFICATION PROCEDURES

A. Owner's Representative will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time as authorized by the Conditions of the Contract by issuing supplemental instructions on AIA Form G710.

B. Construction Change Directive:
Owner's Representative may issue a document, signed by Owner, instructing Construction Manager to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. The document will describe changes in the Work and will designate method of determining any change in Contract Sum or Contract Time.

2. Promptly execute the change in Work.

C. Pricing Request:

Owner's Representative may issue a document which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Construction Manager shall prepare and submit a fixed price quotation within 15 days.

D. Computation of Change in Contract Amount:

1. For change requested by Owner's Representative for work falling under a fixed price contract, the amount will be based on Construction Manager's price quotation.

2. For change requested by Construction Manager, the amount will be based on the Construction Manager's request for a Change Order as approved by Owner.

3. For pre-determined unit prices and quantities, the amount will be based on the fixed unit prices.

4. For change ordered by Owner's Representative without a quotation from the Construction Manager, the amount will be determined by Owner's Representative based on the Construction Manager's substantiation of costs as specified for Time and Material Work.

E. Substantiation of Costs:
Provide full information required for evaluation.

1. Provide the following data:

a. Quantities of products, labor, and equipment

b. Taxes, insurance, and bonds

c. Overhead and profit

d. Justification for any change in Contract Time

e. Credit for deletions from Contract, similarly documented

2. Support each claim for additional costs with additional information:

a. Origin and date of claim

b. Dates and times work was performed, and by whom

c. Time records and wage rates paid

d. Invoices and receipts for products, equipment, and subcontracts, similarly documented

3. For Time and Material Work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.

F. Execution of Change Orders:

Owner's Representatives will issue Change Orders for signatures of parties as provided in the Conditions of the Contract on AIA G701.

G. After execution of Change Order, promptly revise Schedules of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

H. Promptly revise Progress Schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

1.6 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:

1. All closeout procedures specified in Section 01700

PART 2 - PRODUCTS- NOT USED

PART 3 - EXECUTION- NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Project coordination

B. Preconstruction meeting

C. Progress meetings

D. Progress photographs

1.2 RELATED SECTIONS

A. Section 01700-Execution Requirements:
Additional coordination requirements.

B. Section 01780-Closeout Submittals:
Project record documents.

1.3 PROJECT COORDINATION

A. Contractor:
The Contractor shall be responsible for overall project coordination between subcontractors and trade contractors.

B. Cooperate with the Contractor in allocation of mobilization areas of site; for field offices and storage, for personnel access, traffic, and parking facilities.

C. During construction, coordinate use of site and facilities through the Contractor.

D. Comply with Contractor procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts. Particular attention should be given to the Contractor's subcontractor safety policy.

E. Comply with instructions of the Contractor for use of temporary utilities and construction facilities.

F. Coordinate field engineering and layout work under instructions of the Contractor.

G. The Contractor to make the following types of submittals to Owner's Representative:

1. Requests for Interpretation

2. Requests for Substitution

3. Shop Drawings, Product Data, and Samples

4. Test and Inspection Reports

5. Manufacturer's Instructions and Field Reports

6. Applications for Payment and Change Order requests

7. Progress Schedules

8. Coordination of Drawings

9. Closeout Submittals

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 PRECONSTRUCTION MEETING

A. Contractor will schedule a meeting after Notice of Award and prior to mobilization.

B. Attendance Required:

1. Owner:
Owner's Representative and invited Consultants

2. Contractor:
Project Manager and Job Superintendent

3. Major Sub-contractors as requested by the Owner and Contractor.

C. Minimum Agenda:

1. Execution of Owner-Contractor Agreement.

2. Submission of executed bonds and insurance certificates.

3. Submission of progress schedule.

4. Procedures and processing of field decisions, submittals and substitutions, applications for payments, pricing requests, Change Orders, and Contract closeout procedures.

5. Use of premises by Owner and Contractor.

6. Construction facilities and controls provided by Owner.

7. Temporary utilities provided by Owner.

8. Survey and construction layout.

9. Security and housekeeping procedures.

10. Schedules.

11. Application for payment procedures.

12. Procedures for testing.

13. Procedures for maintaining record documents.

14. Scheduling.

15. Scheduling activities of Material Testing.

D. Contractor shall record minutes and distribute copies within five days after meeting to participants, with one copy to Owner's Representative, Owner, participants, and those affected by decisions made.

3.2 PROGRESS MEETINGS

A. Contractor shall schedule and administer meetings throughout the progress of the Work at maximum bi-monthly intervals. A representative from each major trade contractor shall be required to attend these meetings, as requested by the Owner's Representative.

B. The Contractor shall arrange for meetings, prepare agenda with copies for participants, and preside at meetings.

C. Attendance Required:

1. Contractor, Project Manager and Job Superintendent.

2. Owner's Representative.

3. Engineer/Architect.

4. Major Sub-contractors as appropriate to agenda topics for each meeting.

D. Minimum Agenda:

1. Review minutes of previous meetings.

2. Review of Work progress.

3. Field observations, problems, and decisions.

4. Identification of problems which impede planned progress.

5. Review of submittals schedule and status of submittals.

6. Maintenance of progress schedule.

7. Corrective measures to regain projected schedules.

8. Planned progress during succeeding work period.

9. Maintenance of quality and work standards.

10. Effect of proposed changes on progress schedule and coordination.

11. Other business relating to Work.

E. Contractor shall record minutes and distribute copies within five days after meeting to participants, with one copy to Owner's Representative, Owner, participants, and those affected by decisions made.

3.3 PROGRESS PHOTOGRAPHS

A. Provide photographs of site and construction throughout progress of Work produced by an experienced photographer, acceptable to Owner's Representative.

B. Take photographs on date for each application for a payment and as follows:

1. Completed demolition and Site clearing.

2. Excavations.

3. Foundations.

4. Utility Installation – depth, alignment, stub-outs

5. Final completion.

C. Views:

1. Provide non-aerial photographs from three cardinal views at each specified time, until Date of Substantial Completion.

2. Consult with Owner's Representative for instructions on views required.

3. Provide factual presentation.

4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

D. Each Photo: Full color, jpeg format

1. Provide 3 sets on separate USB sticks
Size: 5 MB file

2. Identify each photo on file name. Identify name of Project, contract number, phase, date and orientation of view.

E. Deliver USB sticks with Application for Payment and transmittal letter specified in this Section.

END OF SECTION

SECTION 01325 – CONSTRUCTION PROGRESS SCHEDULE

GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19A & 20 KONGENS GADE, ST.THOMAS, UNITED STATES VIRGIN ISLANDS

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Preliminary schedule.

B. Construction progress schedule, bar chart type.

1.2 RELATED SECTIONS (NOT APPLICABLE)

1.3 SUBMITTALS

A. Within 10 days after date established in Notice To Proceed, submit preliminary schedule defining planned operations for the first 30 days of Work, with a general outline for remainder of Work, in Microsoft Project format on a USB stick.

B. If preliminary schedule requires revision after review, submit by email in the Microsoft Project format a revised schedule within 10 days.

C. Within 30 days after review of preliminary schedule, submit draft of proposed complete schedule by email in the Microsoft Project format for review.

D. Within 10 days after joint review, submit complete schedule by email in the Microsoft Project format.

E. Submit updated paper schedule with each Application for Payment.

F. Submit the number of opaque reproductions that the Contractor requires, plus four copies which will be retained by the Owner's Representative.

G. Submit under transmittal letter form specified in Section 01300.

1.4 QUALITY ASSURANCE

A. Scheduler:
Contractor's personnel specialist Consultant specializing in CPM scheduling with two years minimum experience in scheduling construction work of a complexities comparable to this Project, and having use of computer facilities capable of delivering by email a detailed graphic schedule in Microsoft Project format within 48 hours of request.

1.5 SCHEDULE FORMAT

A. Listings:
In chronological order according to the start date for each activity. Identify each activity with the applicable Specification Section number.

B. Hard Copy Sheet Size: Multiples of 8-l/2 x 11 inches.

C. Scale and Spacing: To allow for notations and revisions.

D. Software Format: Microsoft Project

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PRELIMINARY SCHEDULE

A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.2 CONTENT

A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.

B. Identify each item by Specification Section number.

C. Identify Work of separate stages and other logically grouped activities.

D. Provide separate schedule of submittal dates for shop drawings, product data, and dates reviewed submittals will be required from the Owner's Representative. Indicate decision dates for selection of finishes.

E. Provide legend for symbols and abbreviations used.

3.3 BAR CHARTS

A. Include a separate bar for each major portion of Work or operation.

3.4 REVIEW AND EVALUATION OF SCHEDULE

A. Participate in joint review and evaluation of schedule with Owner's Representative at each submittal.

B. Evaluate project status to determine work behind schedule and work ahead of schedule.

C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.5 UPDATING SCHEDULE

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity.

C. Annotate diagrams to graphically depict current status of Work.

D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

E. Indicate changes required to maintain Date of Substantial Completion.

3.6 DISTRIBUTION OF SCHEDULE

A. Distribute copies of updated schedules to Contractor's project site file, to Subcontractors, Suppliers, Engineer/Architect, Owner's Representative, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Quality assurance- control of installation

B. Tolerances

C. References and standards

D. Mock-up

E. Inspecting and testing laboratory services

F. Manufacturers' field services

1.2 RELATED SECTIONS

A. Section 01000 General Specifications:
Contractor's Shop and Working Drawings.

1.3 QUALITY ASSURANCE - CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Owner's Representative/Engineer before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform Work by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration physical distortion, or disfigurement.

1.4 TOLERANCES

A. Monitor fabrication and installation tolerance control of Products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances conflict with Contract Documents, request clarification from Owner's Representative/Engineer before proceeding.

C. Adjust Products to appropriate dimensions; position before securing Products in place.

1.5 REFERENCES AND STANDARDS

A. For Products or workmanship specified by association, trade, or other consensus standards, complies with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date of Contract Documents, except where a specific date is established by code.

C. Obtain copies of standards where required by product Specification Sections.

D. Neither the contractual relationships, duties, nor responsibilities of the parties in Contract, nor those of the Owner's Representative/Engineer shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.6 MOCK UP (NOT USED)

1.7 INSPECTION AND TESTING LABORATORY SERVICES

A. Owner may appoint, employ, and pay for specified services of an independent firm to perform construction testing services.

B. The independent firm will perform testing and other services specified in individual sections and as required by the Owner.

C. Testing reports will be submitted by the independent firm to the Owner indicating services and indicating compliance or non-compliance with the Contract Documents.

D. Cooperate with independent firm; furnish safe access and assistance by incidental labor as requested.

1. Notify Owner's Representative and/or independent firm 48 hours prior to expected time for operations requiring services. These operations include, but are not necessarily limited to:

a. Cast-in-place concrete placement.

e. Bituminous pavement construction.

1.8 INSPECTION SERVICES

A. Owner may appoint, employ, and pay for specified services of an independent firm to perform observation.

B. The independent firm will perform observations and other services specified in individual Specification Sections and as required by the Owner.

C. Reports will be submitted by the independent firm to the Owner, in duplicate, indicating observations and indicating compliance or non-compliance with Contract Documents.

D. Cooperate with independent firm; furnish safe access and assistance by incidental labor as requested.

1. Notify Owner's Representative and /or independent firm 48 hours prior to expected time for operations requiring services.

E. Observations do not relieve Contractor to perform Work to the contract requirements.

1.9 MANUFACTURERS' FIELD SERVICES

A. When specified in individual Specification Sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, as applicable, and to initiate instructions when necessary.

B. Submit qualifications of observer to Owner 30 days in advance of required observations. Observer subject to approval of Owner.

C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.

C. Examine and verify specific conditions described in individual Specification Sections.

D. Verify that utility services are available, of the correct characteristics, and in the correct locations.

3.2 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

END OF SECTION

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Products

B. Transportation and Handling

C. Storage and Protection

D. Product Options

E. Products List

F. Substitutions

1.2 RELATED REQUIREMENTS

A. Section 01400- Quality Control: Submittal of manufacturer's data

B. Section 01700- Contract Closeout: Operation and maintenance data

PART 2 - PRODUCTS

2.1 GENERAL

A. Products include the material, equipment, and systems used on this Project.

B. Comply with the Specifications and referenced standards as minimum requirements.

C. Components required to be supplied in quantity within a Specification Section shall be the same, and shall be interchangeable.

2.2 TRANSPORTATION AND HANDLING

A. Transport products by methods that will avoid product damage and deliver them in undamaged condition in the manufacturer's unopened containers or packaging.

B. Provide equipment and personnel to handle unloading and storage of the products by methods to prevent soiling or damage.

C. Promptly inspect the shipments to assure that the products comply with requirements, the quantities are correct, and the products are undamaged.

2.3 STORAGE AND PROTECTION

A. Store products in accordance with the manufacturer's instructions, with intact and legible seals and labels.

B. For exterior storage of fabricated products, place on sloped supports above ground. Cover the products subject to deterioration with an impervious sheet covering; provide ventilation to avoid condensation.

C. Store loose granular materials on solid surfaces in a well-drained area. Prevent mixing of the materials with foreign matter.

D. Arrange storage to provide access for inspection. Periodically inspect to assure that products are undamaged and are maintained under required conditions.

2.4 PRODUCT OPTIONS

A. Products specified by Reference Standards or by Description Only: Furnish any product meeting those standards.

B. Products specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not specifically named.

C. Products specified by Naming Several Manufacturers.

D. Products of named manufacturers meeting Specifications: No options, no substitutions will be allowed.

2.5 PRODUCTS LIST

A. Within 15 days after the date of Owner-Contractor Agreement, submit a complete list of major proposed for use, with name of the manufacturer, trade name, and model number of each product.

2.6 SUBSTITUTIONS

A. Only within 15 days after date of the Agreement will the Owner's Representative/Engineer consider requests from the Contractor for substitutions. Subsequently, substitutions will be considered only when a product becomes unavailable due to no fault of the Contractor.

B. Document each request with complete data substantiating the compliance of the proposed substitution with the Contractor Documents.

C. The request constitutes a representation that the Contractor:

1. Has investigated proposed product and determined that it meets or exceeds, in all respects, the specified product.

2. Will provide the same warranty for substitution as for the specified product.

3. Will coordinate installation and make other changes which may be required for the Work to be complete in all respects.

4. Waives claims for additional cost which may subsequently become apparent.

5. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals without separate written request, or when acceptance will require substantial revision of the Contract Documents.

D. Substitutions will not be considered when they are indicated or implied on shop drawings or product data submittals without separate written request, or when acceptance will require substantial revision of the Contract Documents.

E. The Owner's Representative/Engineer will determine acceptability of the proposed substitution and will notify the Contractor of acceptance or rejection in writing within a reasonable time.

F. Only one request for the substitution will be considered for each product. When substitution is not accepted, provide the specified product.

2.7 SYSTEM DEMONSTRATION

A. Prior to the final inspection, demonstrate operation of the entire system to the Owner.

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01620 – TRANSPORTATION AND HANDLING

GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19A & 20 KONGENS GADE, ST.THOMAS, UNITED STATES VIRGIN ISLANDS

PART 1 - GENERAL

A. The Contractor shall provide transportation of all equipment, materials and products furnished under these Contract Documents to the site of the Work. In addition, the Contractor shall provide preparation for shipment and storage, unloading, handling and re-handling, short-term storage, extended storage, storage facilities, maintenance and protection during storage, preparation for installation, and all other work and incidental items necessary or convenient to the Contractor for the satisfactory prosecution and completion of the Work.

PART 2 - TRANSPORTATION

A. All equipment shall be suitably boxed, crafted, or otherwise protected during transportation.

PART 3 - HANDLING

A. All materials, and products shall be carefully handled to prevent damage or excessive deflections during unloading or transportation. All equipment, materials, and products damaged during transportation or handling shall be repaired or replaced by the Contractor at no additional cost to the Authority prior to being incorporated into the Work.

B. Lifting and handling drawings and instructions furnished by the manufacturer or supplier shall be strictly followed. Spreader bars or lifting beams shall be used when the distances between lifting points exceeds that permitted by standard industry practice. Slings and chains shall be padded as required to prevent damage to protective coatings and finishes.

C. Under no circumstances shall equipment or products such as pipe, structural steel, castings, reinforcement, lumber, piles, poles, etc., be thrown or rolled off of trucks onto the ground. Tossing of pipes and pipe fittings and accessories is an unacceptable practice. Items tossed shall be inspected by the Owner's Representative/Engineer and/or Architect. If the Owner's Representative determines that the product has been comprised, Contractor shall replace product at no additional cost to Owner.

D. Items such as non-metallic pipe, non-metallic conduit, flagpoles, and lighting poles shall be handled using non-metallic slings or straps. Under no circumstance shall chains or steel cables be used to transport or handle non-metallic products.

END OF SECTION

PART 1 - GENERAL

A. Equipment shall be received, inspected, unloaded, handled, stored, maintained, and protected by the Contractor in a suitable location on or off site, if necessary, until such time as installation is required.

B. Storage and protection of Contractor-furnished equipment shall be strict conformance with the requirements of the Section entitled "General Equipment Stipulations" of these Specifications.

PART 2 - STORAGE

A. The Contractor shall be responsible for providing satisfactory storage facilities that are acceptable to the Owner's Representative/Engineer. If satisfactory facilities cannot be provided on site, satisfactory warehouse, acceptable to the Owner's Representative/Engineer, will be provided by the Contractor for such time until the materials and products can be accommodated at the site.

B. Materials, and products that are stored in a satisfactory warehouse acceptable to the Owner's Representative/Engineer will be eligible for progress payments as though they had been delivered to the job site.

C. The Contractor shall be responsible for the maintenance and protection of all equipment, materials, and products placed in storage and shall bear all costs of storage, preparation for transportation, transportation, re-handling, and preparation for installation.

D. Equipment and products stored outdoors shall be supported above the ground on suitable wooden blocks or braces arranged to prevent excessive deflection or bending between supports. Items such as pipe, structural steel, and sheet construction products shall be stored with one end elevated to facilitate drainage.

E. Unless otherwise permitted in writing by the Owner's Representative/Engineer, building products such as rough lumber, plywood, concrete block, and structural tile may be stored outdoors under a properly secured waterproof covering.

F. Tarpaulins and other coverings shall be supported above the stored equipment or materials on wooden strips to provide ventilation under the cover and minimize condensation. Tarpaulins and covers shall be arranged to prevent ponding of water.

G. PVC pipe, if stored outside, shall be suitably protected from sunlight (UV) by covering with a tarp or exterior paint. Such covering shall be completed and continual.

PART 3 - EXTENDED STORAGE (NOT USED)

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division - 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:

1. Inspection procedures.
2. Project record document submittal
3. Operating and maintenance manual submittal.
4. Submittal of warranties.
5. Final cleaning.

B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 16, including all Mechanical, Electrical and Plumbing Specifications.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures:
Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.

   a. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.

2. Advise Owner of pending insurance change-over requirements.
3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include permits and similar releases.
5. Deliver tools, extra stock, and similar items.

B. Inspection Procedures:

On receipt of a request for inspection, the Owner will either proceed with inspection or advise the Contractor of unfilled requirements. The Owner will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

1. The Owner will repeat inspection when requested and assured that the Work has been substantially completed.

2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.4 FINAL ACCEPTANCE

A. Preliminary Procedures:
Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.

2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.

3. Submit a certified copy of the Owner's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Owner's Representative.

4. Submit consent of surety to final payment.

5. Submit a final liquidated damages settlement statement.

6. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Re-inspection Procedure:
The Owner will re-inspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Owner's Representative.

1. Upon completion of re-inspection, the Owner's Representative will prepare a certificate of final acceptance or notify the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

2. If necessary, re-inspection will be repeated.

1.5 RECORD DOCUMENT SUBMITTALS

A. General:

Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Owner's reference during normal working hours.

B. Record Drawings:
Maintain a clean, undamaged set of blue or black line white prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.

2. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.

3. Note related Change Order numbers where applicable.

4. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.

C. Record Specifications:
Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications. Give attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.

1. Upon completion of the Work, submit record Specifications to the Owner's Representative for the Owner's records.

D. Record Product Data:
Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.

1. Upon completion of mark-up, submit complete set of record Product Data to the Owner's Representative for the Owner's records.

E. Record Sample Submitted:

Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Owner's Representative and the Owner's personnel to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner's Sample storage area.

F. Miscellaneous Record Submittals:
Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Owner's Representative for the Owner's records.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

A. Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:

1. Record documents
2. Spare parts and materials
3. Tools
4. Cleaning
5. Warranties and bonds

3.2 FINAL CLEANING

A. General:
General cleaning during construction is required by the General Conditions and included in Section "Temporary Facilities".

B. Cleaning:
Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

1. Complete the following cleaning operations before requesting inspection for Final Acceptance.

a. Remove labels that are not permanent labels.

b. Clean exposed exterior hard-surfaced finishes to a dust-free condition, free of stains, film and similar foreign substances.

c. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

C. Removal of Protection:
Remove temporary protection and facilities installed for protection of the Work during construction.

D. Compliance:
Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.

1. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

END OF SECTION

PART 1 -GENERAL

A. During its progress, the Work and the adjacent areas affected thereby shall be kept cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.

B. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipe structures, as a result of Work done under this contact, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the Work, and the ditches, channels, drains, pipes, structures, and work, etc., shall upon completion of the Work, be left in a clean and neat condition.

C. On or before the completion of the Work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by him; shall remove all temporary works, tools, and machinery or other construction equipment furnished by him; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by him; shall remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operations in a neat and satisfactory condition.

D. Upon completion of the Work, the Contractor shall remove from the sites of the subsurface explorations all of his plant, machinery, tools, equipment, temporary work, and surplus materials; shall, unless otherwise directed or permitted in writing, remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operations in a neat and satisfactory condition.

E. The Contractor shall thoroughly clean all materials installed by him and his subcontractors, and on completion of the Work shall deliver it undamaged and in fresh and new-appearing condition.

F. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his Work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end, the Contractor shall do as required all necessary highway or driveway, walk, and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.

G. The Contractor shall submit a Waste Plan and secure a Waste permit from the VI Waste Management Authority

END OF SECTION

PART 1 - GENERAL

A. The Contractor shall warrant all materials, products, and workmanship provided by the Contractor under the Contract for a period of twelve (12) months after the date of final acceptance of the Work by the Owner.

B. If, during the warranty period: (a) Any materials or products furnished and/or installed by the Contractor are found to be defective in service by reason on the Contractor's faulty process, structural and/or mechanical design or Specifications; or (b) Any materials, or products furnished by the Contractor shall, as soon as possible after receipt of such defective materials or products, or replace such defective materials or products.

PART 2 - START-UP OF OPERABLE COMPONENTS

A. Because of the need to maintain operation during construction, it will be necessary to accept operable components of the project at various times prior to the completion and final acceptance of the entire project.

B. A component of the project, as used herein, shall include all associated structures, paving, piping, etc.

C. When a component of the project has been completed, checked out, and made ready for operation, the Contractor shall notify the Owner's Representative/Engineer in writing that the component is substantially complete and request an inspection for substantial completion. The Owner will schedule the inspection within ten (I0) days of the Contractor's request. If he concurs in the Contractor's statement, the Owner's Representative/Engineer will notify the Contractor in writing that the component is accepted as substantially complete. At the same time, the Owner's Representative/Engineer will submit to the Contractor a list of items that must be completed or corrected before final acceptance can be given.

D. If a component of the project is needed in order to maintain operation during construction and if it has been accepted as substantially complete, the Contractor shall start up the component when directed by the Owner. Once the component has achieved stable and satisfactory operation (minimum 95 percent availability over a 7- day period), the Contractor shall request beneficial occupancy by the Owner. The Department, if they concur in the Contractor's statement, that stable and satisfactory operation has been achieved, will notify the Contractor in writing within ten (10) days that he is assuming beneficial occupancy of the component.

E. On the date that the Department assumes beneficial occupancy, the following shall occur:

1. The one-year warranties for the component specified in Part 1-A of this section will begin

2. The Owner will assume responsibility for operating and maintaining the component

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES:

A. Project Record Document submittal.

B. Operation and Maintenance manuals.

C. Warranties, Bonds, Extra Stock, Permits, and Manuals.

1.3 SUBMITTALS:

A. Project Record Documents:
Submit documents to Owner. The following submittal procedure shall occur prior to Final Acceptance.

1. Submit original copy of as-built drawings (Drawings & Specifications) to Owner for review.

2. Compile and organize any drawings or schedules in the Project Manual onto sheets of the same size as the Contract Drawings and into electronic files to submit with other record documents.

3. Contractor will be notified within 15 workdays if the submitted documents are acceptable.

4. Should the submittal be unacceptable for any reason, the Contractor shall make requested modifications and resubmit to the Owner. Continue to resubmit as necessary until the submittal is acceptable.

5. Upon acceptance of the submittal, Owners Engineer will, within 30 workdays, incorporate the Contractor's as-built drawings into the Owner's Engineer's original Contract Documents.

B. Warranties, Bonds, Extra Stock, and Permits:

1. Obtain and assemble executed certificates, warranties, bonds, receipts for extra stock, and permits signed by any authorities having jurisdiction. These may be tabbed in the front of the General Operation and Maintenance Manual provided they do not over-fill the binder.

2. Verify that documents are in proper form and contain full information.

3. Include originals of each in operation and maintenance manual, indexed separately on Table of Contents.

4. Co-execute submittals when required.

5. Submittal of warranties, bonds, extra stock and permit manual to match submittal requirements.

6. Provide Table of Contents neatly typed, in complete and orderly sequence. Include complete information for each of the following:

   a. Product or work item;

   b. Firm, with name of principal, address, and telephone number;

   c. Scope;

   d. Date of beginning of warranty or service and maintenance contract;

   e. Duration of warranty or service maintenance contract;

   f. Proper procedure in case of failure;

   g. Instances which might affect validity of warranty or bond; and

   h. Contractor, name or responsible principal, address, and telephone number.

7. Make submittals within ten days after Date of Substantial Completion.

8. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 - PRODUCTS

2.1 PROJECT RECORD DOCUMENTS:

A. Project Record Documents include the following:

1. Marked-up copies of Project Manuals (Specifications and Detail Book, as applicable), all volumes.

2. Addenda.

3. Reviewed and marked-up copies of shop drawings and product data.

4. Newly prepared drawings.

5. Change Orders, RFIs and other modifications to the Contract issued in printed form during construction.

6. Owner's Representative's Clarifications and Pricing Request with all supporting documentation.

7. Field Authorizations.

8. Record Samples.

9. Field records for variable and concealed conditions.

10. Record information on Work that is recorded only schematically.

11. Manufacturer's instruction for assembly, installation, and adjusting.

12. Other miscellaneous record documents as listed below and applicable.

    a. Authorized measurements utilizing unit prices or allowances.

    b. Ambient and substrate condition tests.

    c. Certifications received in lieu of labels on bulk products.

    d. Testing and qualification of tradesmen.

    e. Documented qualification of installation firms and/or personnel.

    f. Load and performance testing.

    g. Inspections and certifications by governing authorities.

    h. Leakage and water-penetration tests.

    i. Final inspection and correction procedures.

PART 3 -EXECUTION

3.1 PROJECT RECORD DOCUMENTS:

A. Maintenance of Documents and Samples:

1. Store and maintain in field office apart from the Contract Documents used for construction, one complete set of record documents and samples which are used to record as-built conditions.

2. Do not use Project Record Documents for construction purposes; protect from deterioration and loss in a secure fire-resistant location. Maintain record documents in good order and in a clean, dry, legible condition.

3. Always make record documents and samples available for review by Owner's Representative and the Owner.

4. Record actual revisions to the Work concurrent with construction progress.

5. Ensure entries are complete and accurate, enabling future reference by Owner.

a. Following each month Progress Schedule Meeting, Contractor shall meet with all major subcontractors whose work is in progress at the site, including, but not limited to mechanical, plumbing, electrical, security, fire protection, civil, and as otherwise designated, to review all "as-built" revisions on the day-by-day working set of "Project Record Copy" and verify installed record information from the previous moth is properly recorded on the day-by-day "Project Record Copy," with all revisions and pertinent information clearly indicated.

B. Record Drawings and Shop Drawings:

A clean, undamaged set of Contract Drawings including coordination drawings and shop drawings shall be kept at the job site as "as-built" record documents. Record "as-built drawings shall be comprised of all sheets contained in the Contract Drawings, as well as all special equipment or system drawings.

1. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawings that show conditions fully and accurately. Where shop drawings, RFIs or other communication record are used to identify a change, record a cross-reference at the corresponding location on the Contract.

2. Drawings:

Give attention to concealed elements that would be difficult to measure and record later. Items required to be marked include, but are not limited to, the following:

a. Indicate field changes of dimension and detail.

b. RFIs.

c. Note changes of directions and locations, by dimensions and Elevations, as utilities are installed.

d. Show measured locations of construction-concealed internal utilities and appurtenances referenced to visible and accessible features of the structure.

e. Record accurate locations of piping, valves, and the like.

f. Revisions to electrical circuitry.

g. Indicate details not on original Contract Drawings.

h. "X-out" conditions not constructed and appropriately annotate "note constructed" to convey the actual "as-constructed" condition.

3. Mark record sets in a clear, legible manner, using red ink (no pencils); use other colors to distinguish between variations in separate categories of the work. Use 'whiteout' to erase errors.

4. Mark new information that is important to the Owner, but which was not shown on the Contract Documents or Shop Drawings.

5. Show Addenda items, Change Orders, RFI, or other means of communication used in the construction process.

6. Show and date revisions to drawings with a "cloud" drawn around the revision.

7. Organize record drawing sheets in manageable sets, bind with durable paper cover sheets, and print suitable titles, dates, and other identification on the cover of each set. Where shop drawings, RFIs, or other communication record is used as a reference, include a copy of it as part of the Record Drawings.

8. Shop Drawings:

   a. Maintain as record documents; legibly annotate to record changes made after review.

   b. Include subcontractor reproducible shop drawings including as a minimum where applicable to the project, and others as deemed appropriate. Record Drawing shop drawings shall be easily reproducible; as appropriate and approved by the Owner.

C. Project Manual(s):
During the construction period, maintain one complete copy of the Project Manual(s), including Specifications, Detail Book(s), addenda, and one copy of other written Construction Documents, such as Change Orders, and RFIs issued in printed form during construction.

1. Legibly mark these documents in red ink to show substantial variations in actual work performed in comparison with the text of the Specification and modifications. Give attention to substations, selection of options, and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related Record Drawing information and product data. Record at each product section description of actual products installed, including the following:

   a. Product substitutions or alternates utilized.

   b. Changes made by Addenda and modifications.

2. Mark Detail Book schedules, details, etc., to indicate the actual installation where the installation varies from the indicated in the Detail Book and modification issued. Complete information in accordance with paragraph for all detail drawings.

3. Each prime contractor (Subcontractor) is responsible for marking up Sections that contain its own Work.

4. General Contractor shall be responsible for collecting marked-up Sections that contain its own work.

5. General Contractor shall be responsible for submitting the complete set of record Specifications as specified.

D. Record Product Data:

1. Maintain one copy of each data Submittal, and mark-up variations in actual work in comparison with submitted information. Include both variations in product as delivered to the site, and variations from manufacturer's instruction and recommendations for installation.

2. Give attention to concealed products and portions of the work which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark- up of Record Drawings and Project Manuals.

3. Note related Change Orders and mark-up of record Drawings, where applicable.

4. Upon completion of mark-up, submit complete set to Owner's Representative for Owner's records.

5. Where record Product Data is required as part of maintenance manuals, submit marked-up Product Data as an insert in the manual instead of submittal as record Product Data.

6. Each prime contractor (Subcontractor) shall be responsible for marking up and submitting record Product Data for its own Work.

7. Insofar as possible, insert record product data in individual sub-sections of O&M Manuals. Refer to 3.05 below.

E. Record Sample Submittal:
Immediately prior to date(s) of substantial completion, Owner's Engineer will meet with Contractor at site, and will determine which (if any) of submitted samples maintained by Contractor during progress of the work are to be transmitted to Owner for record purposes. Comply with *NE's* instructions for packaging, identification marking, and delivery to Owner's sample storage place.

F. Miscellaneous Record Submittals:
Refer to paragraph above for listing of miscellaneous record documents and to other Sections of these specifications for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the work. Immediately prior to date of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Owner for their records.

3.2 OPERATION AND MAINTENANCE DATA- GENERAL:

A. For Each Product:
List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies.

B. Product Data:
Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings:
Supplement product data to illustrate relations of component parts of systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text:
As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.3 WARRANTIES, BONDS, AND PERMIT MANUAL:

A. Project Warranty-General:

1. If, within one (l) year after the Date of Substantial Completion of the Work, or designated portion thereof, or within such longer period of time as may be prescribed by law or by the terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be defective or not in accordance with the Contract Documents, the Contractor, and where applicable, his subcontractor that portion of the work, shall correct it promptly after receipt of a written notice from the Owner or Owner's Representative to do so. This obligation shall survive Termination of the Contract. The Owner will give such notice promptly after discovery of the condition.

2. Refer to Section 01 78 36 for administrative and procedural requirements for tracking project warranty issues subsequent to date of Substantial Completion.

B. Categories of Specific Warranties:

1. Warranties on the work are in several categories, including those of General Conditions, and including (but not necessarily limited to) the following specific categories related to individual units of work specified in the technical sections of these specifications.

a. Special Project Warranty (Guarantee):
A warranty specifically written and signed by Contractor for a defined portion of the work; and, where required, countersigned by subcontractor, installer, manufacturer or other entity engaged by Contractor.

b. Specified Product Warranty:
A warranty which is required by contract documents, to be provided for a manufactured product incorporated into the work; regardless of whether manufacturer has published warranty without regard for specific incorporation of product into the work, or has written and executed warranty as a direct result of contract document requirements.

c. Coincidental Product Warranty:

A warranty which is not specifically required by contract documents (other than as specified in this section); but which is available on a product incorporated into the work, by virtue of the fact that manufacturer of product has published warranty in connection with purchases and uses of product without regard for specific applications except as otherwise limited by terms of warrantee.

2. Refer to individual sections for the determination of units of work which are required to be specifically or individually warranted, and for the specific requirements and terms of those warranties (or guarantees).

C. Disclaimer and Limitations:
Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

D. General Limitations:
It is recognized the specific warranties are intended primarily to protect the Owner against failure of the work to perform as required, and against deficient, defective, and faulty materials and workmanship, regardless of sources.

E. Related Damages and Losses:

1. General:
In connection with Contractor's correction of warranted work which has failed, remove and replace other work of project which has been damages as a result of such failure, or must be removed and replaced to provide access for correction of warranted work.

2. Consequential Damages:
Except as otherwise indicated or required by governing regulations, Special project warranties and product warranties are not extended to cover damage to building contents (other than work of Contract), which occurs as a result of failure of warranted work.

F. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.

G. Reinstatement of Warranty Period:
Except as otherwise indicated, when work covered by a special project warranty or product warranty has failed and has been corrected by replacement or restoration, reinstate warranty by written endorsement for the time period starting on the date of acceptance of replaced or restored work and ending upon date original warranty would have expired if there had been no failure, with an equitable adjustment for depreciation.

H. Replacement Cost, Obligations:

Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. Contractor shall be responsible for the cost of replacing or restoring defective Work regardless of whether the Owner has benefited from use of the Work through a portion of anticipated useful service life.

I. Owner's Recourse:
Expressed warranties made to the Owner are in condition addition to implied warranties and shall not limit the duties, obligations, right, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.

J. Rejection of Warranties:
Owner reserves the right, at time of final acceptance or thereafter, to reject coincidental product warranties submitted by the Contractor, which in opinion of Owner tend to detract from or confuse interpretation of requirements of Contract Documents.

K. Contractor's Procurement Obligations:
Do not purchase, subcontract for, or allow others to purchase or sub-contract for materials or units of work for project where a special project warranty, specified product warranty, certification or similar commitment is required, until it has been determined that entities required to countersign such commitments are willing to do so.

L. Co-execute warranties when required. Provide originals of each for inclusion in each operation and maintenance manual.

M. Retain warranties and bonds until time specified for submittal.

END OF SECTION

PART 1 - - GENERAL

1.1 SUMMARY

N. Provide boric acid-based wood applied treatment for primary termite control, as herein specified.

O. Limits of termite treatment are as follows:

1. Boric acid product application will be provided to wood structural components in contact with foundations and application to bath traps, plumbing penetration and certain foundation areas.

1.2 REFERENCES

A. General:

1. Standards listed by reference, including revisions by issuing authority, form a part of this specification section to the extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.

B. American Wood-Preservers' Association (AWPA); AWPA Standard M4-01: Standard for the Care of Preservative-Treated Wood Products; 2001.

1. Requires that a preservative be applied to any end cut to protect exposed wood not protected by pressure treatment (as in sill plates) to meet international building code requirements.

C. International Residential Code (IRC) sections that mandate AWPA's *Standard M4* for end cut treatment:

1. Section R319: Protection Against Decay

2. Section R319.1.1 Field Treatment [of End Cuts]

3. Section R320: Protection Against Subterranean Termites

4. Section R320.1.2 Field Treatment [of End Cuts]; 2006.

1.3 SYSTEM DESCRIPTION

A. Performance Requirements:

1. Provides structural termite protection when applied according to the applicable sections of the U.S. Environmental Protection Agency registered label.

1.4 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.5 SUBMITTALS

A. Product Data:

1. Submit applicable manufacturer's technical data and application.

1.6 QUALITY ASSURANCE

A. In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for work, including preparation of structure and application.

B. Engage a professional pest control operator, licensed in accordance with regulations of governing authorities and trained in the application of boric acid wood applied termiticide treatment solution.

1.7 JOB CONDITIONS

A. Restrictions:

1. Treatment will be performed when access to all structural wood members and foundations is available. This is normally at the "dried-in" stage of construction when all structural wood and sheathing is in place and prior to installation of drywall, insulation, mechanical systems and electrical wiring. Comply with handling and application instructions of the product.

1.8 SPECIFIC PRODUCT WARRANTY

A. Furnish written warranty certifying that the applied boric acid based treatment will prevent infestation of subterranean termites and, that if subterranean termite activity is discovered during warranty period, Contractor will re-treat structure and repair or replace damage caused by termite infestation.

PART 2 - PRODUCTS

2.1 BORIC ACID TERMITICIDE, INSECTICIDE & FUNGICIDE

A. Termiticide requirements:

1. Boric acid based primary termiticide treatment that complies with requirements of authorities having jurisdiction over such an application.

2. Boric acid-based treatment shall be provided in a concentrated formulation that dilutes with water or foaming agent.

3. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use according to the registered label.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

A. Compliance:

1. Comply with product data, including product literature, technical bulletins and U.S. EPA registered label.

3.2 APPLICATION

A. Site Preparation:

1. Remove foreign matter that could decrease thoroughness of treatment, such as sawdust, away from treatment surfaces. Move building materials that block or prevent product application to required treatment areas.

B. Application Rates:

1. Apply treatment by label directions to include:

C. The treatment of all structural wood and sill plates within 24 inches of contact with the foundation. Apply a second application to wood within treated area when only one or two surfaces are exposed.

D. The treatment of all cellulosic sheathing within 24 inches of the foundation.

E. The treatment of the concrete slab a minimum of 2 inches out from the wooden sill plate.

F. The treatment of open bath traps at 8-16 ounces of treatment solution per square foot of bath trap with the additional treatment of a 12-inch-wide band of treatment solution on the slab area surrounding the bath trap.

G. The treatment of all pipe and plumbing penetrations with the treatment solution to a height of two feet and extending at least 6 inches out horizontally from the penetration onto slab surface.

H. The treatment of the inside surface of crawlspace concrete or concrete block walls extending vertically up two feet from the soil.

I. The treatment of the inside surface of basement concrete or concrete block walls extending vertically up two feet from the slab.

J. Treat abutting slab areas and expansion joints to cover at least six inches of slab surface out from each side of joint or abutting slab connection.

K. The treatment of termite trails and nests on interior walls.

END OF SECTION

SECTION 024119 – SELECTIVE DEMOLITION

GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19A & 20 KONGENS GADE, ST.THOMAS, UNITED STATES VIRGIN ISLANDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Specifications throughout all Divisions of the Project Manual are directly applicable to this Section, and this Section is directly applicable to them.

1.2 REFERENCE STANDARDS

A. The latest published edition of a reference shall be applicable to this Project unless identified by a specific edition date.

B. All reference amendments adopted prior to the effective date of this Contract shall be applicable to this Project.

C. All materials, installation and workmanship shall comply with all applicable requirements and standards.

1.3 SUBMITTALS

A. Record Documents:

1. Schedule indicating proposed sequence of operations for selective demolition Work to Owner's Representative for review prior to start of Work. Include coordination for shutoff, capping, and continuation of utility services as required, together with details for dust and noise control protection.

   a. Provide detailed sequence of demolition and removal Work to ensure uninterrupted progress of Owner's on-site operations.

   b. Coordinate with Owner's continuing occupation of portions of existing building and with Owner's partial occupancy of completed new addition.

   c. Photographs of existing conditions of structure surfaces, equipment, and adjacent improvements that might be misconstrued as damage related to removal operations. File with Owner's Representative prior to start of Work.

1.4 PROJECT CONDITIONS

A. Owner will occupy portions of the building immediately adjacent to areas of selective demolition. Conduct selective demolition Work in manner that will minimize need for disruption of Owner's normal operations. Provide minimum of 72 hours advance notice to Owner of demolition activities that will affect Owner's normal operations.

B. Owner assumes no responsibility for actual condition of items or structures to be demolished.

1. Conditions existing at time of inspection for bidding purposes will be maintained by Owner insofar as practicable. However, minor variations within structure may occur by Owner's removal and salvage operations prior to start of selective demolition Work.

C. Promptly repair damages caused to adjacent facilities by demolition Work.

D. Conduct selective demolition operations and debris removal to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

1. Do not close, block, or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

E. Do not use cutting torches for removal until Work area is cleared of flammable materials. At concealed spaces, such as interior of ducts and pipe spaces, verify condition of hidden space before starting flame cutting operations. Maintain portable fire suppression devices during flame cutting operations.

F. Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.

1. Do not interrupt utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

2. Maintain fire protection services during selective demolition operations.

3. Use water sprinkling, temporary enclosures, and other methods to limit dust and dirt migration. Comply with governing regulations pertaining to environmental protection.

a. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

PART 2 - PRODUCTS

2.1 GENERAL

A. All materials shall meet or exceed all applicable referenced standards, federal, state and local requirements, and conform to codes and ordinances of authorities having jurisdiction.

2.2 MATERIAL OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, or otherwise indicated to remain the Owner's property, demolished materials shall be become the Contractor's property and shall be removed from the Site with further disposition of the Construction's option.

B. Historical items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to the Owner, which may be encountered during demolition, remain the Owner's property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to the Owner.

PART 3 - EXECUTION

3.1 PREPARATION

A. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of areas to be demolished and adjacent facilities to remain.

B. Cease operations and notify Owner's Representative immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.

C. Locate, identify, stub off, and disconnect utility services that are not indicated to remain.

1. Provide bypass connections as necessary to maintain continuity of service to occupied areas of building. Provide minimum of 72 hours advance notice to Owner if shutdown of service is necessary during changeover.

3.2 INSTALLATION

A. Installation shall meet or exceed all applicable federal, state and local requirements, referenced standards and conform to codes and ordinances of authorities having jurisdiction.

B. All installation shall be in accordance with manufacturer's published recommendations.

3.3 DEMOLITION

A. Perform selective demolition Work in a systematic manner. Use such methods as required to complete Work indicated on Drawings in accordance with demolition schedule and governing regulations.

B. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain using power driven masonry saw or hand tools; do not use power driven impact tools.

C. Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors, or framing.

D. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.

E. Demolish foundation walls to a depth of not less than 12 inches below existing ground surface. Demolish and remove below grade wood or metal construction. Break up below grade concrete slabs.

F. For interior slabs on grade, use removal methods that will not crack or structurally disturb adjacent slabs or partitions. Use power saw where possible.

G. Completely fill below grade areas and voids resulting from demolition Work. Provide fill consisting of approved earth, gravel, or sand, free of trash and debris, stones over 6 inches in diameter, roots, or other organic matter.

H. Remove culvert or sewer pipe for reuse by careful excavation of all material on the top and sides so that the pipe will not be damaged. Removal of sewer appurtenances shall be included for removal with the pipe. Remove pipe which are unsatisfactory for reuse, and dispose of, off the Project Site.

I. Concrete parts of structures below the permanent ground-line shall be neatly squared off with reinforcement cut off close to the concrete.

J. Dismantle steel structures or steel portions of structures in sections determined by the Owner's Representative.

1. The sections shall be of such weight and dimensions which permit convenient handling, hauling and storing.

2. Rivet and bolts connecting steel rail members, steel beams or girder spans and steel stringers of truss spans will be removed by cutting the heads with a cold cut then punching or drilling by a method that will not injure the member for reuse.

3. The removal of rivets and bolts from connections will not be required unless specifically indicated.

4. Unless otherwise specified, the Contractor shall have the option of dismantling these members by flame cutting immediately adjacent to the connection.

5. Flame-cutting will not be permitted when Drawings call for the structural unit to be salvaged in such a manner as to permit re-erection. In such cases, all members shall be carefully dismantled without damage, match marked with paint, and all rivets and bolts removed from the connections.

K. Remove brick and stone structures by sledging the masonry into removal sizes. Portions of such structures below the permanent ground-line, which will not in any manner interfere with the proposed construction, may be left in place, but removal shall be carried at least two feet below the permanent ground-line and neatly squared off.

L. If unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Owner's Representative in written, accurate detail. Pending receipt of directive from Owner's Representative, rearrange selective demolition schedule as necessary to continue overall job progress without undue delay.

3.4 EXCAVATION AND BACKFILL

A. Back-fill to the level of the original ground-line, all excavation made in, and all openings below, the natural ground-line caused by the removal of old structures or portions thereof.

B. That portion of the back-fill which will support any portion of the roadbed or paving shall be placed in layers of the same thickness as those required subgrade preparation.

1. Material in each layer shall be wetted uniformly, if required, and shall be compacted to the density required in the adjoining embankment. In places inaccessible to blading and rolling equipment, mechanical or hand tampers shall be used to obtain the required compaction.

2. Place that portion of the back-fill which will not support any portion of the roadbed or paving in such a manner, and compact, to preclude settling.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove from building Site debris, rubbish, and other materials resulting from demolition operations. Transport and legally dispose off Site.

1. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.

2. Burning of removed materials is not permitted on the Project Site.

3.6 CLEANUP AND REPAIR

A. Upon completion of demolition Work, remove tools, equipment, and demolished materials from the Project Site. Remove protections and leave interior areas broom clean.

B. Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start operations. Repair adjacent construction or surfaces soiled or damaged by selective demolition Work.

END OF SECTION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Specifications throughout all Divisions of the Project Manual are directly applicable to this Section, and this Section is directly applicable to them.

1.2 REFERENCE STANDARDS

A. The latest published edition of a reference shall be applicable to this Project unless identified by a specific edition date.

B. All reference amendments adopted prior to the effective date of this Contract shall be applicable to this Project.

C. All materials, installation and workmanship shall comply with all applicable requirements and standards.

1.3 QUALITY ASSURANCE

A. Single Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.

B. Single Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

C. Preinstallation Conference: Conduct conference at the Project Site to comply with requirements of Division 01.

1.4 SUBMITTALS

A. Product Data:

1. Material certificates for the following signed by manufacturer and Contractor certifying that each material complies with requirements.

a. Each different cement product required for mortar and grout including name of manufacturer, brand, type, and weight slips at time of delivery.

b. Each type and size of joint reinforcement.
Each type and size of anchors, ties, and metal accessories.

B. Samples:

1. Samples for initial selection purposes of the following:

c. Unit masonry samples in small scale form showing full extent of colors and textures available for each different exposed masonry unit required.

d. Colored masonry mortar samples showing full extent of colors available.

2. Samples for verification purposes of the following:

a. Full size units for each different exposed masonry unit required showing full range of exposed color, texture, and dimensions to be expected in completed construction.

b. Include size variation data verifying that actual range of sizes for brick falls within ASTM C 216-dimension tolerances for brick where modular dimensioning is indicated.

c. Colored masonry mortar samples for each color required showing the full range of colors expected in the finished construction. Label samples to indicate type and amount of colorant used.

d. Accessories embedded in the masonry.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver masonry materials to Project in undamaged condition.

B. Store and handle masonry units off the ground, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not place until units are in an air-dried condition.

C. Store cementitious materials off the ground, under cover, and in dry location.

D. Store aggregates where grading and other required characteristics can be maintained, and contamination avoided.

E. Store masonry accessories including metal items to prevent corrosion and accumulation of dirt and oil.

1.6 PROJECT CONDITIONS

A. During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.

B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Remove immediately any grout, mortar, and soil that meets such masonry.

1. Protect base of walls from rain splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.

2. Protect sills, ledges, and projections from mortar droppings.

3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes from mortar droppings.

C. Hot Weather Construction: Comply with referenced unit masonry standard.

1.7 ALLOWANCES

A. Furnish face brick, excluding special molded shapes.

PART 2 PRODUCTS

2.1 GENERAL

A. All materials shall meet or exceed all applicable referenced standards, federal, state and local requirements, and conform to codes and ordinances of authorities having jurisdiction.

B. Comply with referenced unit masonry standard and other requirements specified in this Section applicable to each material indicated.

2.2 BRICK UNITS

A. Comply with the following requirements applicable to each form of brick required:

1. Provide special molded shapes where indicated and as follows:

a. For applications requiring brick of form, color, texture, and size on exposed surfaces that cannot be produced by sawing standard brick sizes.

b. For applications where stretcher units cannot accommodate special conditions including those at corners, movement joints, bond beams, sashes, and lintels.

2. Provide units without cores or frogs and with all exposed surfaces finished for ends of sills, caps, and similar applications that expose brick surfaces that otherwise would be concealed from view.

B. Face Brick Standard: ASTM C 216 and as follows:

1. Type FBX (for general use in exposed masonry requiring minimum variations in size and color ranges).

2. Provide bricks manufactured to the dimensions within the tolerances specified in ASTM C 216 for Standard Modular Brick; 3-5/8 inches thick by 2-1/4 inches high by 7-5/8 inches long.

3. Application: Use where brick is exposed, unless otherwise indicated.

2.3 MORTAR AND GROUT MATERIALS

A. Mortar Cement: U.B.C. Standard No. 21-14

B. Ready Mixed Mortar: Cementitious materials, water, and aggregate complying with requirements specified in this article, combined with set controlling admixtures to produce a ready mixed mortar complying with ASTM C 1142.

C. Hydrated Lime: ASTM C 207, Type S

D. Aggregate for Mortar: ASTM C 144, except for joints less than 1/4 inch use aggregate graded with 100 percent passing the No. 16 sieve.

1. White Mortar Aggregates: Natural white sand or ground white stone

E. Aggregate for Grout: ASTM C 404

F. Water: Clean and potable

2.4 TIES AND ANCHORS, GENERAL

A. Provide ties and anchors specified in subsequent articles that comply with requirements for metal and size of referenced unit masonry standard and of this article.

2.5 ADJUSTABLE ANCHORS FOR CONNECTING MASONRY TO STRUCTURAL FRAMEWORK

A. Two-piece assemblies as described below allowing vertical or horizontal differential movement between wall and framework parallel to plane of wall, but resisting tension and compression forces perpendicular to it.

B. For anchorage to concrete framework, provide manufacturer's standard with dovetail anchor section formed from sheet metal and triangular shaped wire tie section sized to extend within 1 inch of masonry face and as follows:

1. Furnish dovetail slots to concrete trade for installation.

2. Acceptable products include Masonry Reinforcing Corp. "1304/2102", Dur O waL "D/A100/D/A720 723", or Heckman "100/103".

2.6 RIGID ANCHORS

A. Provide straps of form and length indicated, fabricated from metal strips of following width and thickness.

1. 1½ inches wide by ¼ inch thick.

2. As indicated.

2.7 POSTINSTALLED ANCHORS

A. Anchors as described below, with capability to sustain, without failure, load imposed within factors of safety indicated, as determined by testing per ASTM E 488, conducted by a qualified independent testing laboratory.

1. Type: Chemical anchors.

2. Type: Expansion anchors.

3. Corrosion Protection: Stainless steel components complying with ASTM F 593 and ASTM F 594, Group 1 alloy 304 or 316 for bolts and nuts; alloy 304 or 316 for anchor.

4. For cast in place and post installed anchors in concrete: Capability to sustain, without failure, a load equal to 4 times loads imposed by masonry.

2.8 EMBEDDED THROUGH-WALL FLASHING MATERIALS

A. Copper Fabric Laminate: 5-ounce copper sheet bonded with asphalt between 2 layers of glass fiber cloth.

1. "Copper Fabric," Afco Products Inc.

2. "Type FCC Fabric Covered Copper," Phoenix Building Products

3. "Copper Fabric Flashing," Sandell Manufacturing Co., Inc.

4. "York Copper Fabric Flashing," York Manufacturing, Inc.

B. Adhesive for Flashings: Of type recommended by manufacturer of flashing material for use indicated.

2.9 MISCELLANEOUS MASONRY ACCESSORIES

A. Expansion and Control Joint Fillers:

1. Premolded Expansion Joint Filler: Closed cell polyethylene foam material with a density of ±2 psf, and compatible with most sealants. Acceptable products include Sonneborn "Sonoflex F" and Williams Products Inc. "Expand O Foam 1380 Series".

2. Construction Joint Filler: Closed cell expanded neoprene foam material with a density of 15 to 35 psf, flame resistant, and compatible with most sealants. Acceptable products include Williams Products Inc. "Neoprene Type NN1" and Rubatex Corp. "R 1800 FS".

3. Premolded Control Joint Strip: Solid rubber strips with a Shore A durometer hardness of 60 to 80, designed to fit standard sash blocks and maintain lateral stability of masonry wall. Provide strips in width approximately 2" less than thickness of masonry wythe. Acceptable products include Dur O waL "Rapid Control Joint" and Hohman & Barnard "QS Series".

2.10 MORTAR AND GROUT MIXES

A. Do not add admixtures including coloring pigments, air entraining agents, accelerators, retarders, water repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.

B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification, for types of mortar indicated below:

C. Proportions listed are in the following order, by volume of cementitious materials: (Portland Cement):(Hydrated Lime or Lime Putty):(Aggregate). Aggregate volume is based on the sum of the separate volumes of other cementitious materials.

1. Limit cementitious materials in mortar to Portland cement lime.

2. Use Type N mortar for all other exterior and interior walls: (1):(1/2 to 1 1/4):(2 1/4 to 3).

D. Provide grout complying with ASTM C 476, of consistency indicated or, if not otherwise indicated, of consistency (fine or coarse) at time of placement which will completely fill all spaces intended to receive grout.

1. Provide grout in the following proportions, by volume: (1 part Portland cement):(0 to 1/10 part hydrated lime or lime putty):(aggregate, 2½ to 3 times the sum of the volumes of other cementitious materials). Add coarse aggregate in the proportion of 1 to 2 times the sum of the volumes of other cementitious materials for "coarse" grout.

2. Use fine grout in grout spaces less than 2 inches in horizontal direction, unless otherwise indicated.

3. Use coarse grout in grout spaces 2 inches or more in least horizontal dimension, unless otherwise indicated.

PART 3 EXECUTION

3.1 PREPARATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other specific conditions, and other conditions affecting performance of unit masonry.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of unit masonry.

B. Examine rough in and built in construction to verify actual locations of piping connections prior to installation.

C. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with referenced unit masonry standard and other requirements indicated applicable to each type of installation included in Project.

B. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single wythe walls to the actual thickness of the masonry units, using units of nominal thickness indicated.

C. Cut masonry units with motor driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full size units without cutting where possible.

3.3 CONSTRUCTION TOLERANCES

A. Comply with construction tolerances of referenced unit masonry standard.

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement type joints, returns, and offsets. Avoid the use of less than half size units at corners, jambs, and where possible at other locations.

B. Bond Pattern for Exposed Masonry: Lay exposed masonry in the following bond pattern; do not use units with less that nominal 4-inch horizontal face dimensions at corners or jambs.

1. One half running bond with vertical joint in each course centered on units in courses above and below.

C. Stopping and Resuming Work: In each course, rack back 1/2-unit length for one half running bond or 1/3-unit length for one third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly (if required), and remove loose masonry units and mortar prior to laying fresh masonry.

D. Built In Work: As construction progresses, build in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built in items.

1. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.

a. At exterior frames insert extruded polystyrene board insulation around perimeter of frame in thickness indicated but not less than ¾ inch to act as a thermal break between frame and masonry.

2. Where built in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.

3.5 MORTAR BEDDING AND JOINTING

A. Lay brick units with full mortar coverage on bed and head joints. Furrowing of joints will not be permitted.

B. Cut joints flush for masonry walls to be concealed or to be covered by other materials, unless otherwise indicated.

3.6 ANCHORING MASONRY TO STRUCTURAL MEMBERS

A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:

1. Provide an open space not less than 1 inch in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.

2. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.

3. Space anchors as indicated, but not more than 24 inches on center vertically and 36 inches on center horizontally.

B. Temporary Formwork: Construct formwork and shores to support reinforced masonry elements during construction.

1. Construct formwork to conform to shape, line, and dimensions shown. Make sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.

C. Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.

D. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

3.7 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units and in fresh mortar or grout, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point up all joints including corners, openings, and adjacent construction to provide a neat, uniform appearance, prepared for application of sealants.

C. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.

2. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.

3. Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.

4. Clean brick by means of bucket and brush hand cleaning method described in BIA "Technical Note No. 20 Revised".

5. Clean concrete masonry by means of cleaning method indicated in NCMA TEK 45 applicable to type of stain present on exposed surfaces.

D. Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure unit masonry is without damage and deterioration at time of Substantial Completion.

END OF SECTION

SECTION 040523-MASONRY ACCESSORIES
GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19A & 20 KONGENS GADE, ST.THOMAS, UNITED STATES VIRGIN ISLANDS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Rainscreen Drainage Planes:

1. Full Brick Veneers:

a. Sure Cavity. (SC 5016 and SC 5032)

b. 10MM Sure Cavity. (SCMM 2516 and SCMM 2532)

c. Gravity Cavity. (GC 1816 and GC 1832)

B. Exterior Horizontal Low Slope Drainage Plane and Slip Sheet:

1. Sure Cavity. (SC 5016 & SC 5032)

C. Window Rough Opening Sill Drainage Plane:

1. Window Drainage Plane. (WDP 5000)

2. Concealed Steel Lintel:

a. Concealed Steel Lintel/Shelf Angle Weep System. (CLW 9040)

3. Concealed Shelf Angle:

a. Concealed Steel Lintel/Shelf Angle Weep System. (CLW 9040)

b. Vent Strip. (VS 3845)

D. Masonry Accessories:

1. Moisture Diverter. (DS 2858)

2. Mortar Belt. (MB 3550)

3. Trash Mortar Diverter. (TMD 9548)

1.2 RELATED SECTIONS

A. Section 04 20 00 - Unit Masonry.

B. Section 06 10 00 - Rough Carpentry.

C. Section 07 27 00 - Air Barriers.

1.3 REFERENCES

A. ASTM International (ASTM):

1. ASTM D 4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles; 1996 (2209).

2. ASTM D 4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 1991 (2008).

3. ASTM D 4833 - Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products; 2000 (2007).

4. ASTM E 2273 - Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies; 2003.

5. ASTM G 154 - Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials; 2000a (2006).

B. CAN/CGSB 148.1 No. 7.3 - Methods of Testing Geotextiles and Geomembranes Grab Tensile Test for Geotextiles; 1992.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Administrative Requirements.

B. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.

2. Storage and handling requirements and recommendations.

3. Installation methods.

C. Shop Drawings: Provide drawings of special joint conditions.

D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.

B. Installer Qualifications: Minimum 2 year experience installing similar products.

1.6 PRE-INSTALLATION MEETINGS

A. Convene minimum two weeks prior to starting work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage and Handling Requirements: Store materials in clean, dry, inside area in accordance with manufacturer's instructions. Protect materials from damage during handling and installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Masonry Technology, Inc, which is located at: 24235 Electric St. P. O. Box 214; Cresco, IA 52136; Toll Free Tel: 800-879-3348; Tel: 563-547-1122; Fax: 563-547-1133; Email:request info (info@mtidry.com); Web:www.mtidry.com

B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 MASONRY ACCESSORLES

A. MTI Edge Metal (MEM 3168):

1. Description: Formed metal termination to accommodate rainscreen drainage plane material.

2. Material: 26-gauge galvanized steel, bent into "J" shaped channel, with long vertical leg and short leg at 5 degree angle out from other leg.

a. Length of Long Vertical Leg: 3-21/32 inches (92.9 mm).

b. Anchor Holes in Vertical Leg: 3/16-inch (4.76 mm) diameter

i. Vertical Spacing: 1-5/16 inches (33.3 mm) apart.

ii. Horizontal Spacing: 2-3/4 inches (69.8 mm) apart.

c. Length of Short Leg: 3/8 inch (9.5mm)

d. Width at Bottom: 11/32 inch (8.6mm).

e. Length: 8 feet (2.4m).

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 VERIFICATION OF CONDITIONS

A. Verify that field conditions are acceptable and are ready to receive this work.

B. Verify that related items provided under other sections are properly sized and located.

3.4 DRAINAGE PLANE INSTALLATION

A. Moisture Diverter (DS 2858) for thin veneers:

1. Install Moisture Diverter directly above wall openings such as windows and doors and not in contact with mounting flanges or flashing systems.

2. Install Moisture Diverter providing a watertight seal against weather resistant barrier on masonry and concrete substrates and flash the top on sheathing substrates.

3. Install Moisture Diverter with 1/4 inch per foot (6.35 mm per 305 mm) slope-to-drain and extend sides at least 4 inches (102mm) beyond door and window mounting flange and trim boards on both sides.

4. Install required accessories such as rainscreen drainage plane and flashing for complete installation.

B. Interface with Other Work: Provide proper installation of other materials and work as necessary for a complete and properly functioning system.

3.5 PROTECTION

A. Protect installed thin veneer system from damage during construction.

B. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Framing with dimension lumber.

2. Wood furring, grounds, nailers, and blocking.

1.3 DEFINITIONS

A. Rough Carpentry:
Carpentry work not specified in other Sections and not exposed, unless otherwise specified.

1.4 SUBMITTALS

A. General:
Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data for the following products:

1. Construction adhesives.

C. Material certificates for dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the American Lumber Standards Committee's (ALSC) Board of Review.

D. Wood treatment data as follows, including chemical treatment manufacturer's instructions for handling, storing, installing, and finishing treated materials:

1. For each type of preservative treated wood product, include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.

2. For fire retardant treated wood products, include certification by treating plant that treated materials comply with specified standard and other requirements as well as data relative to bending strength, stiffness, and fastener-holding capacities of treated materials.

E. Material test reports from a qualified independent testing agency indicating and interpreting test results relative to compliance of fire-retardant-treated wood products with requirements indicated.

1.5 QUALITY ASSURANCE

A. Single-Source Responsibility for Fire-Retardant-Treated Wood:

Obtain each type of fire-retardant treated wood product from one source and by a single producer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Keep materials under cover and dry. Protect from weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels. Provide for air circulation within and around stacks and under temporary coverings.

1. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers:
Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Wood-Preservative-Treated Materials:

a. Baxter: J. H. Baxter Co.

b. Chemical Specialties, Inc.

c. Continental Wood Preservers, Inc.

d. Hickson Corp.

e. Hoover Treated Wood Products, Inc.

f. Osmose Wood Preserving, Inc.

2. Fire-Retardant-Treated Materials, Interior Type A:

a. Baxter: J. H. Baxter Co.

b. Chemical Specialties, Inc.

c. Continental Wood Preservers, Inc.

d. Hickson Corp.

e. Hoover Treated Wood Products, Inc.

2.2 LUMBER, GENERAL

A. Lumber Standards:
Comply with DOC PS 20, "American Softwood Lumber Standard," and with applicable grading rules of inspection agencies certified by ALSC's Board of Review.

B. Inspection Agencies:
Inspection agencies, and the abbreviations used to reference them, include the following:

1. NELMA - Northeastern Lumber Manufacturers Association.

2. NLGA - National Lumber Grades Authority (Canadian).

3. RIS- Redwood Inspection Service.

4. SPIB - Southern Pine Inspection Bureau.

5. WCLIB- West Coast Lumber Inspection Bureau.

6. WWPA- Western Wood Products Association.

C. Grade Stamps:
Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.

D. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.

1. Provide dressed lumber, S4S, unless otherwise indicated.

2.3 WOOD-PRESERVATIVE-TREATED MATERIALS

A. General:
Where lumber is indicated as preservative treated or is specified to be treated, comply with applicable requirements of AWPA C2 (lumber) and AWPA C9 (plywood). Mark each treated item with the Quality Mark Requirements of an inspection agency approved by ALSC's Board of Review.

1. Do not use chemicals containing chromium or arsenic.

B. Pressure treat aboveground items with waterborne preservatives to a minimum retention of 0.25 lb./cu. ft. (4.0 kg/cu. m). After treatment, kiln-dry lumber and plywood to a maximum moisture content of 19 and 15 percent, respectively. Treat indicated items and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

3. Wood framing members less than 18 inches (460 mm) above grade.

4. Wood floor plates installed over concrete slabs directly in contact with earth.

C. Complete fabrication of treated items before treatment, where possible. If cut after treatment, apply field treatment complying with AWPA M4 to cut surfaces. Inspect each piece of lumber after drying and discard damaged or defective pieces.

2.4 FIRE-RETARDANT-TREATED MATERIALS

A. General:
Where fire-retardant-treated wood is indicated, comply with applicable requirements of AWPA C20 (lumber) and AWPA C27 (plywood). Identify fire-retardant-treated wood with appropriate classification marking of UL; U.S. Testing; Timber Products Inspection, Inc.; or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Research or Evaluation Reports:
Provide fire-retardant-treated wood acceptable to authorities having jurisdiction and for which a current model code research or evaluation report exists that evidences compliance of fire-retardant-treated wood for application indicated.

B. Interior Type A:
For interior locations, use chemical formulation that produces treated lumber and plywood with the following properties under conditions present after installation:

1. Bending strength, stiffness, and fastener-holding capacities are not reduced below values published by manufacturer of chemical formulation under elevated temperature and humidity conditions simulating installed conditions when tested by a qualified independent testing agency.

2. No form of degradation occurs due to acid hydrolysis or other causes related to treatment.

3. Contact with treated wood does not promote corrosion of metal fasteners.

2.5 DIMENSION LUMBER

A. General:
Provide dimension lumber of grades indicated according to the ALSC National Grading Rule (NGR) provisions of the inspection agency indicated.

B. Framing Other than Non-Load-Bearing Partitions:
Provide framing of the following grade and species:

1. Grade: No. 2.

2. Species: Southern pine; SPIB.

3. Species: Mixed southern pine; SPIB.

4. Species: Any species above.

2.6 MISCELLANEOUS LUMBER

A. General:

Provide lumber for support or attachment of other construction, including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping, and similar members.

B. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.

C. Moisture Content:
19 percent maximum for lumber items not specified to receive wood preservative treatment.

D. Grade:
For dimension lumber sizes, provide No. 3 or Standard grade lumber per ALSC's NGRs of any species. For board-size lumber, provide No.3 Common grade per NELMA, NLGA, or WWPA; No.2 grade per SPIB; or Standard grade per NLGA, WCLIB or WWPA of any species.

2.7 FASTENERS

A. General:
Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.

B. Nails, Wire, Brads, and Staples: FS FF-N-105.

C. Power-Driven Fasteners: CABO NER-272.

D. Wood Screws: ASME Bl8.6.l.

E. Lag Bolts: ASME Bl8.2.l. (ASME B18.2.3.8M)

F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

2.8 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Framing: Formulation complying with APA AFG-01 that is approved for use with type of construction panel indicated by both adhesive and panel manufacturers.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Discard units of material with defects that impair quality of rough carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.

B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted.

C. Fit rough carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.

D. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.

E. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. CABO NER-272 for power-driven staples, P-nails, and allied fasteners.

2. Published requirements of metal framing anchor manufacturer.

3. "Recommended Nailing Schedule" of referenced framing standard and with AFPA's "National Design Specifications for Wood Construction."

4. "Table 23-1-Q--Nailing Schedule" of the Uniform Building Code.

5. "Table 2305.2--Fastening Schedule" of the BOCA National Building Code.

6. "Table 1705.1--Fastening Schedule," of the Standard Building Code.

F. Use common wire nails, unless otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required.

G. Use stainless-steel nails where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity.

H. Countersink nail heads on exposed carpentry work and fill holes with wood filler.

3.2 WOOD GROUNDS, NAILERS, BLOCKING, AND SLEEPERS

A. Install wood grounds, nailers, blocking, and sleepers where shown and where required for screeding or attaching other work. Form to shapes shown and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to form work before concrete placement.

C. Install permanent grounds of dressed, preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 WOOD FRAMING, GENERAL

A. Framing Standard:
Comply with AFPA's "Manual for Wood Frame Construction," unless otherwise indicated.

B. Install framing members of size and at spacing indicated.

C. Do not splice structural members between supports.

END OF SECTION

SECTION 064000 – ARCHITECTURAL WOODWORK

GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19A & 20 KONGENS GADE, ST.THOMAS, UNITED STATES VIRGIN ISLANDS

PART 1 GENERAL

1.1 SUMMARY

A. Related Documents:

1. Drawings and general provisions of the Subcontract apply to this Section.

2. Review these documents for coordination with additional requirements and information that apply to work under this Section.

B. Section Includes:

1. Standing and running trim.

2. Interior wood door frames.

3. Stripping, blocking, furring and nailers required for millwork and installed from face of walls, floors and ceilings.

C. Related Sections:

1. Division 01 Section "General Requirements."

2. Division 06 Section "Rough Carpentry".

3. Division 06 Section "Architectural Wood Casework".

4. Division 09 Section "Painting".

1.2 REFERENCES

A. General:

1. The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.

2. Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.

3. Refer to Division 01 Section "General Requirements" for the list of applicable regulatory requirements.

B. Architectural Woodwork Institute

1. Architectural Woodwork Quality Standards. Latest edition.

1.3 SUBMITTALS

A. Submit under provisions of Divisions 01 Section "General Requirements" and "Special Procedures."

B. Shop Drawings: Submit for all millwork items and related accessories. Indicate anchorage methods.

C. Samples:

1. Submit 6 by 8 inches (150 by 200 mm) samples each wood specie which is to receive job applied transparent finish.

2. Submit samples to establish permissible variations for compatibility of color and grain.

3. Submit for shop applied wood finishes. Submit on actual species specified. Samples shall be affixed with label giving full description of finish and number of coats.

1.4 QUALITY ASSURANCE

A. Millwork shall be manufactured in accordance with the AWI Standards in the grades hereinafter specified. In event of a dispute as to the quality grades, all parties will call upon an inspection under AWI's inspection procedures and agree to abide by the decision of AWI.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Work of this Section shall be stored flat in a dry, well ventilated space protected from inclement weather. Use care in handling and storing materials to assure proper ventilation and to protect edges and avoid any disfigurement, scratches or corner bruises. Damaged or warped material shall be immediately replaced with new, undamaged material.

B. Make adequate provisions for receiving all materials. Sign for and inspect deliveries. If damage is observed or discovered, note the same on delivery slip and notify the University. If damage is concealed, notify trucker and the University when discovered. After delivery, Subcontractor assumes liability for all subsequent damage to materials and equipment.

C. Make no deliveries of millwork until areas are completely enclosed and wet work completed.

PART 2 PRODUCTS

2.1 MATERIALS

A. General: Items noted or specified as to species (i.e., White Maple", "Birch", etc.) may be presumed to receive a transparent finish. Items which are not designated by species or which are designated or specified as "wood" or "hardwood" may be presumed to receive an opaque finish.

B. Solid Stock: Solid stock trim used with plywood items shall match the plywood unless otherwise noted.

1. Items noted or specified as "Wood", "Hardwood", or not otherwise designated by species: Natural Birch.

2.2 FABRICATION GRADES

A. Opaque Finished Items: Custom Grade.

B. Drawings indicate general appearance standards only and are not intended to reduce compliance with specified grade of millwork.

2.3 FABRICATION

A. Surfacing: Wood items shall be smoothly machines and sanded on exposed surfaces as required by grade.

B. Frames: Jambs and heads shall be rabbeted.

C. Shelves: Adjustable shelving shall be banded on all exposed edges; fixed shelving shall be banded on front edge. Edge bands may be solid wood or veneer edge.

PART 3 EXECUTION

3.1 CONDITION OF SURFACES

A. Inspect materials and surfaces prior to installation and report all defects. Proceeding with installation implies acceptance of surfaces as satisfactory.

B. Clean materials as required.

C. Do not attempt to install equipment which is missing parts which will require disassembly or removal later in order to install parts necessary for a functional operation.

3.2 PREPARATION

A. Coordinate work under this Section with other trades whose work adjoins, combines or aligns with same. Take such field measurements as may be required. Report any major discrepancy between Drawings and field dimensions to the Project Manager and secure directions before proceeding.

3.3 INSTALLATION

A. General:

1. Set work in place, scribe plumb, square and level and secure in position indicated with required fastenings, clips, braces, anchors, blocking, shimming and other fittings required to properly secure.

2. Ease exposed edges.

3. Blind nail items where possible; where not possible, use finish nails set for putty. Staples, T-nails and similar fastenings are not permitted for exposed surfaces.

4. Make standing trim single lengths, running trim in longest lengths possible. Miter cut running joints tight and flush on exposed faces and edges. Miter or cope inside corner joints; miter outside corners. Miter and return exposed ends, returns less than 1" longer than thickness, drilled, glued and nailed.

5. Wood millwork not shop finished shall be back primed (under Division 09 "Painting") prior to setting in place.

6. Hammer marks and other defects caused by installation procures may result in rejection of the item damaged.

B. Paneling: Locate joints as indicated, plumb and level, butted tight to adjacent pieces and metal trim, grain direction vertical. Panels shall be a single pied between indicated joints. Install panels using concealed metal clips; face nailing not permitted.

C. Shelves: Shelving which in not noted as adjustable may be presumed to be fixed. Fixed shelving shall be installed on ¾ by 3-1/2 inches (20 mm by 90 mm) hook strips continuous three sides. Provide shelf and rod support to limit spans to 4 feet (1.22 m). Install symmetrically. Adjustable shelving shall be installed with specified hardware, surface mounted.

D. Install hardboard over wood spacers in one piece without joints. Fasten with oval head wood screws at 8 inches (200 mm) o.c. around perimeter and at 16 inches (400 mm) o.c. at intermediate bearings.

3.4 CLEANUP

A. Upon completion of the work, remove all debris, rubbish and surplus materials from the site, resulting from work under this Section.

END OF SECTION

SECTION 07270-AIR/WEATHER RESISTANT BARRIER

GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19A & 20 KONGENS GADE, ST.THOMAS, UNITED STATES VIRGIN ISLANDS

PART 1 GENERAL

1.1 SUMMARY

A. Includes but not limited to: Furnish and install air barrier/weather resistant barrier over interior of brick inlays at windows at all locations regardless of whether or not indicated on drawings to protect interior walls.

1.2 RELATED SECTIONS

A. Section 05400- Cold Formed Metal Framing

B. Section 07261 - Sheathing

C. Section 07620- Flashing and Sheet Metal

1.3 REFERENCES

A. General: Submit each item in this Article according to the conditions of the Contact and Division 1 Specifications Sections.

B. Technical Association of the Pulp and Paper Industry

C. American Association of Textile Chemist and Colorists

1.4 REFERENCES

A. General: Submit each item in this Article according to the conditions of the Contact and Division I Specifications Sections.

B. Product Data: Submit product specifications, technical data and installation instructions of manufacturer equaling or exceeding those specified.

C. American Association of Textile Chemist and Colorists

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Installer with successful experience in the installation of air barrier/secondary weather resistant barriers.

B. Install job mock-up using specified air barrier/secondary weather resistant barrier with system of fastening and taping seams as per manufacturer's instructions. Obtain Owner's Representative's approval of system for appearance and workmanship standard.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer or approved equal:
DuPont Weatherization Systems
4417 Lancaster Pike, Building 728, Wilmington, DE 19805
Contact: 800-448-9835; Website: www.tyvek.com

2.2 MATERIALS

A. Weather resistant Barrier:

1. DuPont™ Tyvek® CommercialWrap®: A flash spun bonded olefin, non-woven, non-perforated secondary weather resistant barrier.

2. Approved equal.

B. Performance Characteristics:

1. AATCC-127, Water Penetration Resistance, exceeded at 280

2. TAPPIT-460, Gurley Hill (sec/100cc) Air infiltration at >1500 seconds

3. ASTM E 96 Method B (g/m2-24hr.) Water vapor transmission of 200

4. TAPPI-4- ID, Basis weight of 2.7oz/yd

5. ASTM E96 Methods B, Water Vapor Transmission, 28 perms

6. ASTM E1677, Air Retarder Material Standard Specification, Type I air barrier

C. Sealing Tape/Fasteners:

1. DuPont™ Tyvek® Tape, DuPont Weatherization Systems or approved equal

2. For steel frame construction:

a. DuPont™ Tyvek® Wrap Cap Screws, DuPont Weatherization Systems or approved equal. 1 5/8" rust resistant screws with 2" diameter plastic cap.

3. For wood frames construction:

a. DuPont™ Tyvek® Wrap Caps, DuPont Weatherization Systems or approve equal. Nails with large heads or plastic washers.

4. Caulks or Sealants:

a. Polyurethane or elastomeric sealants

i. Available Products:

1) OSI® Quad Pro-Series®, solvent release butyl rubber sealant

2) DAP® Dyanflex 230™

3) Other products as approved and recommended by air barrier/weather resistant barrier manufacturer

PART 3 EXECUTION

3.1 INSTALLATION

A. Install Air Barrier over interior side of brick wall inlay, and under all drywall.

1. Install Air Barrier before interior walls are installed.
2. Ensure barrier is plum and level with foundation and unroll extending Air Barrier over window openings.
3. Attach Air Barrier to masonry, use adhesive recommended by manufacturer.
4. Tape all horizontal and vertical seams of Air Barrier with DuPont™ Tyvek® Tape.
5. Seal all tears and cuts in Air Barrier with DuPont™ Tyvek® Tape.

END OF SECTION

SECTION 07900 - JOINT SEALERS

GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19A & 20 KONGENS GADE, ST.THOMAS, UNITED STATES VIRGIN ISLANDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. The sealing of joints indicated on schedule at the end of this section.

2. The sealing of exterior joints, including:

a. Exterior face of building expansion joints.

3. The sealing of interior joints including:

a. Joints around perimeter of frame.

B. Joints of a nature like that of joints indicated on the schedule shall be sealed with the same sealer, whether indicated on drawings to be sealed or not.

1. Related Sections:

a. Fire stopping/smoke stopping sealers:
Elsewhere in Division 7

b. Joint sealers in waterproofing work:
Elsewhere in Division 7

1.2 REFERENCES

A. ASTM C 719-93 - Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle); 1993.

B. ASTM C 834-95- Standard Specification for Latex Sealants; 1995.

C. ASTM C 920-95- Standard Specifications for Elastomeric Joints Sealants 1995.

D. ASTM C 1193-91- Standard Guide for Use of Joint Sealants; 1991.

E. ASTM D 3405-78 - Standard Specification for Joint Sealants, Hot-poured for Concrete and Asphalt Pavements; 1978.

F. ASTM D 3406-85(91) - Standard Specification for Joint Sealant, Hot-Applied, Elastomeric -Type, for Portland cement Concrete Pavements 1985 (Reapproved 1991).

G. FS A-A-272- Caulking Compounds; 1980.

H. FS SS-S-200E- Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold-Applied, for Portland cement Concrete Pavement; 1984 (Amended 1988).

1.3 DEFINITIONS

A. Substrates:

1. M-type substrates:
Concrete, concrete masonry units, brick, mortar and natural stone. The term "masonry" means brick, stone, and concrete masonry work.

2. A-type substrates:
Metals, porcelain, glazed tile, and smooth plastics

3. 0-type substrates:
Woods, unglazed tile; substrates not included under other categories

1.4 SUBMITTALS

A. Product Data:

1. Manufacturer's data on each joint sealer, with instruction for substrate preparation and installation.

B. Field Installation Test Reports.

C. Certificates:
For each sealer, provide manufacturer's certificates stating that the product complies with the specifications and is appropriate for the use it is being put to.

D. Installer's Preconstruction Inspection Report:
List all conditions detrimental to performance of joint sealer work.

1.5 QUALITY ASSURANCE

A. Field Installation Tests:
Before installation, test the adhesion of all sealers to actual substrates.

1. Seal at least 5-foot lengths of joints and cure properly. Try to pull sealer out of joint by hand, by method recommended by sealer manufacturer.

2. Select test joint representative of joints to be sealed by the product to be tested.

3. Perform tests for each type of sealer used on exterior and each type of elastomeric sealant used on interior.

4. Do tests in the presence of the Project Manager.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original containers or bundles with labels showing manufacturer, product name or designation, color, shelf life, and installation instructions.

1.7 PROJECT CONDITIONS

A. Environmental Limitations:

Do not install sealers if any of the following conditions exist.

1. Air or substrate temperature exceeds the range recommended by sealer manufacturers.

2. Substrate is wet or damp.

B. Dimensional Limitations:
Do not install sealers if joint dimensions are less than or greater than that recommended by sealer manufacturer; notify alternative procedures.

1.8 WARRANTY

A. Submit written warranty signed by Contractor and installer guaranteeing correct failures in sealer work that occur within 10 years after substantial completion, without reducing or otherwise limiting any other rights to correction which the owner may have under the contract documents. Failure is defined as failure to remain weathertight due to faulty materials or workmanship. Correction is limited to replacement sealers.

PART 2 - PRODUCTS

2.1 MATERIALS - GENERAL

A. General:
Provide only products which are recommended and approved by their manufacturer for the specific use to which they are put, and which comply with all requirements of the contract documents.

1. For each generic product, use only materials from one manufacturer.

2. Provide only materials which are compatible with each other and joint substrates.

3. Colors of exposed sealers:
As selected by the Owner's Representative from manufacturer's standard colors

2.2 ELASTOMERIC SEALANTS

A. Elastomeric Sealants General:
Chemically curing elastomeric sealants types indicated, complying with ASTM C 920, including specific type, Grade, Class, and Uses indicated, as well as all other requirements specified.

1. For A-type substrates:
Comply with requirements for Use A

2. For 0-type substrates:
Comply with requirements for Use M. (minimum) and use 0 for the substrate.

2.3 SEALANT BACKERS

A. Backers- General: No staining; recommended or approved by sealant manufacturer for specific use.

B. Backers Rods:

Flexible, nonabsorbent, compressible polyurethane foam either open-cell or non-gassing closed-cell, unless otherwise restricted by sealant manufacturer; preformed to appropriate size and shape.

2.4 MISCELLANEOUS MATERIALS

A. Primers:
As recommended by sealer manufacturer.

B. Cleaners:
As recommended by sealer manufacturer and not damaging to substrates.

C. Masking Tape:
Nonabsorbent, no staining.

D. Tooling Agents:
Approved by sealant manufacturer; no staining to sealant and substrate.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints for characteristics that may affect sealer performance including configuration and dimensions.

B. Do not begin joint sealer work until unsatisfactory conditions have corrected.

3.2 PREPARATION

A. Cleaning:
Just before starting sealer installation, clean out joints accord with recommendations of sealer manufacturers and as follows:

1. Remove all material that could impair adhesion, including dust, dirt, coatings, paint, oil, and grease. Exception: Materials tested to show acceptable adhesion and compatibility.

2. Dry out damp and wet substrates thoroughly.

3. Clean M-type and 0-type substrates by suitable mechanical or chemical methods.

4. Remove loose particles by vacuuming or by blowing with oil-free compressed air.

5. Concrete: Remove laitance and form-release coatings.

6. Clean A-type and G-type substrates by chemical or other method which will not damage the substrate.

7. Use methods which will not leave residues that will impair adhesion.

B. Priming:
Prime substrates as recommended by sealer manufacturer.

C. Marking Tape:
Use masking tape to keep primers and sealers off of adjacent surfaces which would be damaged by contact or by cleanup. Remove tape as soon as practical.

D. Install fillers where needed to provide proper joint depth or support for sealant backers.

3.3 INSTALLATION

A. Comply with sealer manufacturers' installation instructions and recommendations, except where more restrictive requirements are specified.

B. Gun Applied and Pourable Sealants:
Comply with recommendations of ASTM C 1193.

C. Backers:
Install backers at depth required to result in shape and depth of installed sealant which allows the most joint movement without failure.

1. Make backers continuous, without gaps, tears, or punctures. Do not stretch or twist backers.

D. Sealants:
Use methods recommended by manufacturer; completely fill the joint; make full contact with bond surfaces; tool no sag sealants to smooth surface eliminating air pockets.

1. Use concave joint shape shown in Figure 5A in ASTM C 1193, where not otherwise indicated.

3.4 PROTECTION AND CLEANING

A. Cleaning surfaces adjacent to joints as work progresses and before sealants set using methods and materials approved by manufacturers of sealers and of surfaces to be cleaned.

B. Protect joint sealers from contamination and damage.

C. Remove and replace damage sealers.

D. General:
Unless otherwise indicated, joints around perimeter of frames, where indicated to be sealed, are to be sealed using sealer specified for the substrate to the frame.

E. Exterior Joints for Which No Other Sealer Is Indicated:

1. Use one of the following sealants:

a. Medium movement silicone sealant

b. One-part no sag urethane sealant

c. One-part no sag low-modulus urethane sealant

2. Backer: Backer rod

3. Joint shape: Concave joint configuration

F. Interior Joints for Which No Other Sealer Is Indicated:

1. Use one of the following sealants:

a. Acrylic-emulsion latex sealant

2. Backer: Backer rod

3. Joint shape: Concave joint Configuration

4. Backer: Backer rod.

5. Joint shape: Concave joint configuration.

END OF SECTION

SECTION 09255 – GYPSUM BOARD ASSEMBLIES

GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19A & 20 KONGENS GADE, ST.THOMAS, UNITED STATES VIRGIN ISLANDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Non-load-bearing steel framing members for gypsum board assemblies.

2. Gypsum board assemblies attached to steel framing.

B. Related Sections:
The following Sections contain requirements that relate to this Section:

1. Division 6 Section "Rough Carpentry" for the following: Wood blocking and grounds.

1.1 DEFINITIONS

A. Gypsum Board Construction Terminology:
Refer to ASTM C 11 and GA-505 for definitions of terms related to gypsum board assemblies not defined in this Section or in other referenced standards.

1.2 ASSEMBLY PERFORMANCE REQUIREMENTS

A. Sound Transmission Characteristics:
For gypsum board assemblies indicated to have STC ratings, provide materials and construction identical to those of assemblies whose STC ratings were determined per ASTM E 90 and classified per ASTM E 413 by a qualified independent testing agency.

1.3 SUBMITTALS

A. General:
Submit the following according to Conditions of the Contract and Division 1 Specification Sections.

B. Product data for each type of product specified.

C. Product certificates signed by manufacturers of gypsum board assembly components certifying that their products comply with specified requirements.

1.4 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics:

Where fire-rated gypsum board assemblies are indicated, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E II9 by an independent testing and inspecting agency acceptable to authorities having jurisdiction. Fire Resistance Ratings: As indicated by reference to GA File Numbers in GA-600 "Fire Resistance Design Manual" or to design designations in UL "Fire Resistance Directory" or in the listing of another testing and inspecting agency acceptable to authorities having jurisdiction.

B. Single-Source Responsibility for Steel Framing:
Obtain steel framing members for Gypsum board assemblies from a single manufacturer.

C. Single-Source Responsibility for Panel Products:
Obtain each type of Gypsum board and other panel products from a single manufacturer.

D. Single-Source Responsibility for Finishing Materials:
Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.

B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Neatly stack Gypsum panels flat to prevent sagging.

C. Handle gypsum board to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.

1.6 PROJECT CONDITIONS

A. Environmental Conditions, General:
Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 and with Gypsum board manufacturer's recommendations.

B. Room Temperatures:
For non-adhesive attachment of gypsum board to framing, do not exceed 95 deg F (35 deg C).

C. Ventilation:
Ventilate building spaces, as required, for drying joint treatment materials. Avoid drafts during hot dry weather to prevent finishing materials from drying too rapidly.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers:
Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

1. Gypsum Board and Related Products:

   a. Domtar Gypsum.

   b. Georgia-Pacific Corp.

   c. Gold Bond Building Products Div., National Gypsum Co.

2.2 GYPSUM BOARD PRODUCTS

A. General:
Provide Gypsum Board of types indicated in maximum lengths available to minimize end-to-end butt joints. Thickness: Provide Gypsum Board in thicknesses indicated or, if not otherwise indicated, in 5/8 inch thicknesses to comply with ASTM C 840 for application system and support spacing indicated.

B. Gypsum Wallboard: ASTM C 36 and as follows:

1. Type: Type X required for all assemblies

2. Type: Sag-resistant type for ceiling surfaces

3. Edges: Tapered

4. Thickness: 5/8 inch unless otherwise indicated

5. Available Products:
Subject to compliance with requirements, products that may be incorporated in the Work where proprietary gypsum wallboard is indicated include, but are not limited to, the following:

   a. Gyprock Fireguard C Gypsum Board, Domtar Gypsum.

   b. Firestop Type C, Georgia-Pacific Corp.

   c. Fire-Shield G, Gold Bond Building Products Div., National Gypsum Co.

   d. SHEETROCK Brand Gypsum Panels, FIRECODE C Core, United States Gypsum Co.

   e. SHEETROCK Brand Gypsum Panels, ULTRACODE Core, United States Gypsum Co.

C. Gypsum Backing Board for Multilayer Applications:
ASTM C 442 or, where backing board is not available from manufacturer, gypsum wallboard, ASTM C 36 and as follows:

1. Type: Type X required for all assemblies

2. Edges: Square, not tapered; or V-tongue and groove

3. Thickness: 5/8 inch unless otherwise indicated

D. Water-Resistant Gypsum Backing Board: ASTM C 630 and as follows:

1. Type: Regular, unless otherwise indicated

2. Type: Type X where required for fire-resistive-rated assemblies

3. Thickness: 5/8 inch, unless otherwise indicated

2.3 TRIM ACCESSORIES

A. Accessories for Interior Installation:
Corner beads, edge trim, and control joints complying with ASTM C 1047 and requirements indicated below:

1. Material:
Formed metal, plastic, or metal combined with paper, with metal complying with the following requirement:

a. Sheet steel zinc-coated by hot-dip process.

b. Sheet steel coated with zinc by hot-dip or electrolytic processes, or with aluminum or rolled zinc.

2. Shapes indicated below by reference to Fig. 1 designations in ASTM C 1047:

a. Cornerbead on outside corners, unless otherwise indicated

b. LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim unless otherwise indicated.

c. L-bead with face flange only; face flange formed to receive joint compound. Use L-bead where indicated.

d. U-bead with face and back flanges; face flange formed to be left without application of joint compound. Use U-bead where indicated.

e. One-piece control joint formed with V-shaped slot, with removable strip covering slot opening

2.4 JOINT TREATMENT MATERIALS

A. General:
Provide joint treatment materials complying with ASTM C 475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.

B. Joint Tape for Gypsum Board:
Paper reinforcing tape, unless otherwise indicated. Use pressure-sensitive or staple-attached open-weave glass-fiber reinforcing tape with compatible joint compound where recommended by manufacturer of Gypsum Board and joint treatment materials for application indicated.

C. Setting-Type Joint Compounds for Gypsum Board:
Factory-packaged, job-mixed, chemical-hardening powder products formulated for uses indicated.

1. Where setting-type joint compounds are indicated as a taping compound only or for taping and filling only, use formulation that is compatible with other joint compounds applied over it.

2. For prefilling gypsum board joints, use formulation recommended by Gypsum Board manufacturer for this purpose.

3. For filling joints and treating fasteners of water-resistant Gypsum backing board behind base for ceramic tile, use formulation recommended by the Gypsum Board manufacturer for this purpose.

4. For topping compound, use sandable formulation.

D. Drying-Type Joint Compounds for Gypsum Board:
Factory-packaged vinyl-based products complying with the following requirements for formulation and intended use.

1. Ready-Mixed Formulation: Factory-mixed product

2. Job-Mixed Formulation: Powder product for mixing with water at Project site

3. Taping compound formulated for embedding tape and for first coat over fasteners and face flanges of trim accessories.

4. Topping compound formulated for fill (second) and finish (third) coats

5. All-purpose compound formulated for both taping and topping compounds.

E. Joint Compound for Cementitious Backer Unit:
Material recommended by cementitious backer unit manufacturer.

2.5 MISCELLANEOUS MATERIALS

A. General:
Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of Gypsum Board manufacturer.

B. Laminating Adhesive: Special adhesive or joint compound recommended for laminating Gypsum panels.

C. Spot Grout: ASTM C 475, setting-type joint compound recommended for spot grouting hollow metal door frames.

D. Fastening Adhesive for Wood: ASTM C 557.

E. Fastening Adhesive for Metal: Special adhesive recommended for laminating Gypsum panels to steel framing.

F. Steel drill screws complying with ASTM C 1002 for the following applications:

1. Fastening Gypsum Board to steel members less than 0.03 inch thick.

2. Fastening Gypsum Board to wood members.

3. Fastening Gypsum Board to gypsum board.

G. Steel drill screws complying with ASTM C 954 for fastening gypsum board to steel members from 0.033 to 0.112 inch thick.

H. Corrosion-resistant-coated steel drill screws of size and type recommended by board manufacturer for fastening cementitious backer units.

I. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), unperforated.

J. Sound Attenuation Blankets:
Unfaced mineral-fiber blanket insulation produced by combining mineral fibers of type described below with thermosetting resins to comply with ASTM C 665 for Type I (blankets without membrane facing):

K. Mineral-Fiber Type: Fibers manufactured from glass.

L. Polyethylene Vapor Retarder:
ASTM D 4397, thickness and maximum permeance rating as follows:

1. 4.0 mils, 0.19 perms.

M. Vapor Retarder Tape:
Pressure-sensitive tape of type recommended by vapor retarder manufacturer for sealing joints and penetrations in vapor retarder.

PART 3 - EXECUTION

3.1 EXAMINATION

Examine substrates to which gypsum board assemblies attach or abut, installed hollow metal frames, cast-in-anchors, and structural framing with Installer present for compliance with requirements for installation tolerances and other conditions affecting performance of assemblies specified in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISIDNG GYPSUM BOARD, GENERAL

A. Gypsum Board Application and Finishing Standards:
Install and finish Gypsum panels to comply with ASTM C 840 and GA-216.

B. Install wall/partition board panels to minimize the number of abutting end joints or avoid them entirely. Stagger abutting end joints not less than one framing member in alternate courses of board. At high walls, install panels horizontally with end abutting joints over studs and staggered.

C. Install Gypsum panels with face side out. Do not install imperfect, damaged, or damp panels. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

D. Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Position adjoining panels so that tapered edges abut tapered edges, and field-cut edges abut field-cut edges and ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions. Avoid joints at corners of framed openings where possible.

E. Attach gypsum panels to steel studs so that the leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

F. Attach gypsum panels to framing provided at openings and cutouts.

G. Form control joints and expansion joints at locations indicated and as detailed, with space between edges of adjoining Gypsum panels, as well as supporting framing behind Gypsum panels.

H. Cover both faces of steel stud partition framing with Gypsum panels in concealed spaces (above ceilings, etc.), except in chase walls that are braced internally.

1. Except where concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.

2. Fit Gypsum panels around ducts, pipes, and conduits.

3. Where partitions intersect structural members projecting below underside of roof decks, cut gypsum panels to fit profile formed by coffers, joists, and other structural members; allow 1/4- to-1/2-inch-wide joints to install sealant.

I. Isolate perimeter of non-load-bearing gypsum board partitions at structural abutments as detailed and required. Provide 1/4-inch wide spaces at these locations and trim edges with U-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

J. Where STC-rated gypsum board assemblies are indicated, seal construction at perimeters, behind control and expansion joints, openings, and penetrations with a continuous bead of acoustical sealant including a bead at both faces of the partitions. Comply with ASTM C 919 and manufacturer's recommendations for location of edge trim and closing off sound-flanking paths around or through Gypsum Board assemblies, including sealing partitions above acoustical ceilings.

K. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.

3.3 GYPSUM BOARD APPLICATION METHODS

A. Single-Layer Application:
Install Gypsum wallboard panels as follows:

1. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated, and provide panel lengths that will minimize end joints.

B. Single-Layer Fastening Methods:
Apply gypsum panels to supports as follows: Fasten with screws.

3.4 INSTALLING TRIM ACCESSORIES

A. General:
For trim accessories with back flanges, fasten to framing with the same Fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners.

B. Install corner beads at external corners.

C. Install edge trim where edge of gypsum panels would otherwise be exposed or semi-exposed. Provide edge trim type with face flange formed to receive joint compound except where other types are indicated.

1. Install LC-bead where gypsum panels are tightly abutted to other construction and back flange can be attached to framing or supporting substrate.

2. Install L-bead where edge trims can only be installed after gypsum panels are installed.

3. Install U-bead where indicated.

3.5 FINISHING GYPSUM BOARD ASSEMBLIES

A. General:
Apply joint treatment at gypsum board joints (both directions); flanges of corner bead, edge trim, and control joints; penetrations; fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration and levels of gypsum board finish indicated.

B. Prefill open joints, rounded or beveled edges, and damaged areas using setting type joint compound.

C. Apply joint tape over gypsum board joints except those with trim accessories having concealed face flanges not requiring taping to prevent cracks from developing in joint treatment at flange edges.

D. Apply joint tape over gypsum board joints and to trim accessories with concealed face flanges as recommended by trim accessory manufacturer and as required to prevent cracks from developing in joint compound at flange edges.

E. Levels of Gypsum Board Finish:
Provide the following levels of gypsum board finish per GA-214:

1. Level 4 for gypsum board surfaces indicated to receive light-textured finishes, wallcoverings, and flat paints over light textures.

F. For level 4 gypsum board finish, embed tape in finishing compound plus two separate coats applied over joints, angles, fastener heads, and trim accessories using one of the following combinations of joint compounds (not including prefill), and sand between coats and after last coat.

3.6 CLEANING AND PROTECTION

A. Promptly remove any residual joint compound from adjacent surfaces.

B. Provide final protection and maintain conditions, in a manner suitable to Installer that ensures gypsum board assemblies remain without damage or deterioration at time of Substantial Completion.

END OF SECTION

PART 1 ·GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes surface preparation and field painting of the following:

1. Exposed interior items and surfaces.

2. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

B. Paint exposed surfaces, except where the paint schedules indicate that a surface or material is not to be painted or is to remain natural. If the paint schedules do not specifically mention an item or a surface, paint the item or surface the same as similar adjacent materials or surfaces whether schedules indicate colors. If the schedules do not indicate color or finish, the Owner's Representative will select from standard colors and finishes available.

1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.

C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1. Prefinished items include the following factory-finished components:

a. Architectural woodwork and casework.

b. Finished mechanical and electrical equipment.

c. Light fixtures.

d. Distribution cabinets.

2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:

a. Ceiling plenums.

3. Finished metal surfaces include the following:

a. Anodized aluminum

b. Stainless steel

c. Chromium plate

d. Copper

e. Bronze and brass

4. Labels:
Do not paint over Underwriters Laboratories (UL), Factory Mutual (FM), or other code required labels or equipment name, identification, performance rating, or nomenclature plates.

D. Related Sections include the following:

1. Division 6 Section "Architectural Woodwork" for shop priming interior architectural woodwork

2. Division 9 Section "Gypsum Board Assemblies" for surface preparation for gypsum board

1.3 DEFINITIONS

A. General:
Standard coating terms defined in ASTM D 16 apply to this Section.

1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85- degree meter.

2. Eggshell refers to low-sheen finish with a gloss range between 5 and 20 when measured at a 60-degree meter.

3. Satin refers to low-sheen finish with a gloss range between 15 and 35 when measured at a 60- degree meter.

4. Semi-gloss refers to medium-sheen finish with a gloss range between 30 and 65 when measured at a 60-degree meter.

5. Full gloss refers to high-sheen finish with a gloss range more than 65 when measured at a 60- degree meter.

1.4 SUBMITTALS

A. Product Data:
For each paint system specified. Include block fillers and primers.

1. Material List:
Provide an inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.

2. Manufacturer's Information:
Provide manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material proposed for use.

3. Certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).

B. Samples for Verification:
Of each color and material to be applied, with texture to simulate actual conditions.

C. Qualification Data:
For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Owner's Representative and owners, and other information specified.

1.5 QUALITY ASSURANCE

A. Applicator Qualifications:
Engage an experienced applicator who has completed painting system applications similar in material and extent to that indicated for this Project with a record of successful in- service performance.

B. Source Limitations:
Obtain block fillers, primers, and undercoat materials for each coating system from the same manufacturer as the finish coats.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the Project Site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:

1. Product name or title of material
2. Product description (generic classification or binder type)
3. Manufacturer's stock number and date of manufacture
4. Contents by volume, for pigment and vehicle constituents
5. Thinning instructions
6. Application instructions
7. Color name and number
8. VOC content

B. Store materials not in use in tightly covered containers in a well-ventilated area. Maintain containers used in storage in a clean condition, free of foreign materials and residue.

1. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.7 PROJECT CONDITIONS

A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are below 90°F (32°C).

B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are below 95°F (35°C).

C. Do not apply paint when the relative humidity exceeds 85 percent; or at temperatures less than 5°F (3°C) above the dew point; or to damp or wet surfaces.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and within temperature limits specified by manufacturer during application and drying periods.

1.8 EXTRA MATERIALS

A. Furnish extra paint materials from the same production run as the materials applied in the quantities described below. Package paint materials in unopened, factory-sealed containers for storage and identify with labels describing contents. Deliver extra materials to the Owner.

1. Quantity:
Furnish the Owner with a 1-gallon can of each type of finish coat of each color, taken from lots furnished for the work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products:
Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in the paint schedules.

B. Manufacturers Names:
The following manufacturers are referred to in the paint schedules by use of shortened versions of their names, which are shown in parentheses:

1. Devoe & Raynolds Co. (Devoe).

2. Fuller-O'Brien Paints (Fuller).

3. Glidden Co. (The) (Glidden).

4. Benjamin Moore & Co. (Moore).

5. PPG Industries, Inc. (PPG).

6. Pratt & Lambert, Inc. (P & L).

7. Sherwin-Williams Co. (S-W).

8. Martin Seymour Co. (MS).

2.2 PAINT MATERIALS, GENERAL

A. Material Compatibility:

Provide block fillers, primers, undercoats, and finish-coat materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality:
Provide manufacturer's best-quality paint material of the various coating types specified. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

1. Proprietary Names:
Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.

C. Colors:
Match colors indicated by reference to manufacturer's color designations.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with the Applicator present, under which painting will be performed for compliance with paint application requirements.

1. Do not begin to apply paint until unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.

2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

B. Coordination of Work:
Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify the Owner's Representative about anticipated problems using the materials specified over substrates primed by others.

3.2 PREPARATION

A. General:
Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of the size or weight of the item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

B. Cleaning:

Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease before cleaning.

1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation:
Clean and prepare surfaces to be painted according to manufacturer's written instructions for each substrate condition and as specified.

1. Provide barrier coats over incompatible primers or remove and re-prime.

2. Ferrous Metals:
Clean un-galvanized ferrous metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with the Steel Structures Painting Council's (SSPC) recommendations.

a. Blast steel surfaces clean as recommended by paint system manufacturer and according to requirements of SSPC-SP 10.

b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.

c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with the same primer as the shop coat.

3. Galvanized Surfaces:
Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

D. Materials Preparation:
Mix and prepare paint materials according to manufacturer's written instructions.

1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.

2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.

3. Use only thinners approved by paint manufacturer and only within recommended limits.

E. Tinting:
Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

A. General:
Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.

1. Paint colors, surface treatments, and finishes are indicated in the schedules.

2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.

3. Provide finish coats that are compatible with primers used.

4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convector covers, covers for finned-tube radiation, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.

5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.

6. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.

7. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.

8. Sand lightly between each succeeding enamel or varnish coat.

B. Scheduling Painting:
Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. The number of coats and the film thickness required are the same regardless of application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.

2. Omit primer on metal surfaces that have been shop primed and touch up painted.

3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

4. Allow enough time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.

C. Application Procedures:
Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.

1. Brushes:
Use brushes best suited for the type of material applied. Use brush of appropriate size for the surface or item being painted.

2. Rollers:
Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.

3. Spray Equipment:
Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required.

D. Minimum Coating Thickness:
Apply paint materials no thinner than manufacturers recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.

E. Mechanical and Electrical Work:
Painting of mechanical and electrical work is limited to items exposed in equipment rooms and in occupied spaces.

F. Mechanical items to be painted include, but are not limited to, the following:

1. Piping, pipe hangers, and supports

2. Equipment supports

3. Accessory items

G. Electrical items to be painted include, but are not limited to, the following:

1. Conduit and fittings

H. Prime Coats:
Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn through or other defects due to insufficient sealing.

I. Pigmented (Opaque) Finishes:
Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

J. Completed Work:
Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.4 CLEANING

A. Cleanup:

At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from the site.

1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.5 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Owner's Representative.

B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.

1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA Pl.

3.6 INTERIOR PAINT SCHEDULE

A. Gypsum Board:
Provide the following finish systems over interior gypsum board surfaces:

1. Flat Acrylic Finish: 2 finish coats over a primer

2. Primer:
Latex-based, mildew inhibiting interior primer, such as Kilz2 or approved equal, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils (0.031 mm).

3. Use only thinners approved by paint manufacturer and only within the recommended limits.

B. First and Second Coats:
Flat, acrylic-latex-based, interior paint applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.5 mils (0.064 mm).

C. Ferrous Metal:
Provide the following finish systems over ferrous metal:

1. Semi-gloss, Acrylic-Enamel Finish: One finish coat over an enamel undercoat and a primer

a. Primer:
Quick-drying, rust-inhibitive, alkyd-based or epoxy-metal primer, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.5 mils (0.038 mm).

b. Undercoat:
Alkyd, interior enamel undercoat or semi-gloss, acrylic-latex, interior enamel, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.3 mils (0.033 mm).

c. Finish Coat:
Semi-gloss, acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.3 mils (0.033 mm).

D. Zinc-Coated Metal:
Provide the following finish systems over zinc-coated metal:

1. Semi-gloss, Acrylic-Enamel Finish: 2 finish coats over a primer

a. Primer:
Galvanized metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils (0.031 mm).

b. First and Second Coats:
Semi-gloss, acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.6 mils (0.066 mm).

E. Tinting:
Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of the same material are being applied. Tint undercoats to match the color of the finish coat but provide enough difference in shade of undercoats to distinguish each separate coat.

END OF SECTION

SECTION 233713 – DIFFUSERS, REGISTERS AND GRILLES

GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19A & 20 KONGENS GADE, ST.THOMAS, UNITED STATES VIRGIN ISLANDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fixed face registers and grilles

B. Related Sections:

1. Division 08 for fixed and adjustable louvers and wall vents, whether they are connected to ducts.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated, include the following:

1. Data Sheet:
Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static pressure drop, and noise ratings.

2. Diffuser, Register, and Grille Schedule: Indicate drawing designation, room location, quantity, model number, size, and accessories furnished.

B. Samples:
For each exposed product and for each color and texture specified

PART 2 - PRODUCTS

2.1 REGISTERS AND GRILLES

A. Fixed Face Grille:

1. Basis of Design Product:
Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

a. Carnes

b. Nailor Industries Inc.

c. Price Industries

d. Titus

2. Material: Aluminum

3. Finish: Baked enamel, color selected by Owner's Representative

4. Face Arrangement: 1/2-by-1/2-by-1/2-inch (13-by-13-by-13-mm) grid core

5. Mounting: Concealed

2.2 SOURCE QUALITY CONTROL

A. Verification of Performance:
Rate diffusers, registers, and grilles according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install grilles level and plumb.

B. Install grilles with airtight connections to three (3) walls, one (1) door of the Reception Room and one (1) door of the Utility Room

3.2 ADJUSTING

A. After installation, adjust grilles to air patterns indicated, or as directed.

END OF SECTION

SECTION 260500 - BASIC ELECTRICAL MATERIALS AND METHODS

GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19A & 20 KONGENS GADE, ST.THOMAS, UNITED STATES VIRGIN ISLANDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division I Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following electrical materials and methods:

1. Supporting devices for electrical components

2. Electrical Identification

3. Touchup painting

1.3 SUBMITTALS

A. General:
Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data for each type of product specified.

C. Samples of color, lettering style, and other graphic representation required for each identification product for Project.

1.4 QUALITY ASSURANCE

A. Comply with NFPA 70 for components and installation.

B. Listing and Labeling:
Provide products specified in this Section that are listed and labeled.

1. The Terms "Listed and Labeled":
As defined in the National Electrical Code, Article 100.

2. Listing and Labeling Agency Qualifications A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

1.5 SEQUENCING AND SCHEDULING

A. Coordinate electrical equipment installation with other building components.

B. Arrange for chases, slots, and openings in building structure during progress of construction to allow for electrical installations.

C. Coordinate installing required supporting devices and set sleeves in poured in place concrete and other structural components as they are constructed.

D. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work.

E. Coordinate connecting electrical service to components furnished under other Sections. Refer to Division 15.

F. Coordinate requirements for access panels and doors where electrical items requiring access are concealed by finished surfaces. Access panels and doors are specified in Division 8 Section "Access Doors."

G. Coordinate installing electrical identification after completion of finishing where identification is applied to field finished surfaces.

PART 2 - PRODUCTS

2.1 SUPPORTING DEVICES

A. Channel and angle support systems, hangers, anchors, sleeves, brackets, fabricated items, and fasteners are designed to provide secure support from the building structure for electrical components.

1. Material: Stainless steel, except as otherwise indicated

2. Metal Items for Use Outdoors or in Damp Locations: Stainless steel, except as otherwise indicated

B. Steel channel supports have 9/16-inch (14-mm) diameter holes at a maximum of 8 inches (203 mm) O.C., in at least 1 surface.

1. Fittings and accessories mate and match with channels and are from the same manufacturer.

C. Nonmetallic Channel and Angle Systems:
Structural grade, factory formed, fiberglass resin channels and angles with 9/16-inch (14-mm) diameter holes at a maximum of 8 inches (203 mm) O.C., in at least 1 surface.

1. Fittings and accessories mate and match with channels or angles and are from the same manufacturer.

2. Fitting and Accessory Material:
Same as channels and angles, except metal items may be stainless steel.

D. Raceway and Cable Supports:
Manufactured clevis hangers, riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring steel clamps or "click" type hangers.

E. Cable Supports for Vertical Conduit:
Factory fabricated assembly consisting of threaded body and insulating wedging plug for non-armored electrical cables in riser conduits. Plugs have number and size of conductor gripping holes as required to suit individual risers. Body constructed of malleable iron casting with hot dip galvanized finish.

F. Expansion Anchors: Carbon-steel wedge or sleeve type.

G. Toggle Bolts: All-steel springhead type.

H. Powder-Driven Threaded Studs: Heat-treated steel.

2.2 ELECTRICAL IDENTIFICATION

A. Manufacturer's Standard Products:
Where more than one type is listed for a specified application, selection is Installer's option, but provide single type for each application category. Use colors prescribed by ANSI A13.1, NFPA 70, and these Specifications.

B. Raceway and Cable Labels:
Conform to ANSI Al3.1, Table 3, for minimum size of letters for legend and minimum length of color field for each raceway or cable size.

1. Type:
Preprinted, flexible, self-adhesive, vinyl. Legend is over-laminated with a clear, weather and chemical resistant coating.

2. Color: Black legend on orange field

3. Legend: Indicates voltage

C. Colored Adhesive Marking Tape for Raceways, Wires, and Cables:
Self-adhesive vinyl tape not less than 3 mils thick by 1 inch wide (0.08 mm thick by 25 mm wide)

D. Engraved, Plastic Laminated Labels, Signs, and Instruction Plates:
Engraving stock, melamine plastic laminate punched for mechanical fasteners 1/16-inch (1.6-mm) minimum thick for signs up to 20 sq. in. (129 sq. em), 1/8 inch (3.2 mm) thick for larger sizes. Engraved legend in black letters on white face.

I. Interior Warning and Caution Signs:
Preprinted, aluminum, baked enamel finish signs, punched for fasteners, with colors, legend, and size appropriate to the application.

J. Fasteners for Plastic Laminated and Metal Signs:
Self-tapping stainless-steel screws or No. 10/32 stainless steel machine screws with nuts and flat and lock washers.

2.3 TOUCHUP PAINT

A. For Equipment: Provided by equipment manufacturer and selected to match equipment finish.

B. For Non-Equipment Surfaces: Matching type and color of undamaged, existing adjacent finish.

C. For Galvanized Surfaces: Zinc-rich paint recommended by item manufacturer.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION REQUIREMENTS

A. Install components and equipment to provide the maximum possible headroom where mounting heights or other location criteria are not indicated.

B. Install items level, plumb, and parallel and perpendicular to other building systems and components. Install equipment to facilitate service, maintenance, and repair or replacement of components.

C. Connect for ease of disconnecting, with minimum interference with other installations.

D. Give right of way to raceways and piping systems installed at a required slope.

3.2 ELECTRICAL SUPPORTING METHODS

A. Damp Locations and Outdoors: Stainless steel materials or nonmetallic, U-channel system components.

B. Dry Locations: Steel materials.

C. Support Clamps for PVC Raceways: Click type clamp system.

D. Conform to manufacturer's recommendations for selecting supports.

E. Strength of Supports:
Adequate to carry all present and future loads, times a safety factor of at least 4; 200-lb (90-kg) minimum design load.

3.3 INSTALLATION

A. Install wires in raceway according to manufacturer's written instructions and NECA's "Standard of Installation."

B. Conductor Splices:
Keep to the minimum and comply with the following:

1. Install splices and taps that possess equivalent or better mechanical strength and insulation ratings than un-spliced conductors.

2. Use splice and tap connectors that are compatible with conductor material.

C. Connect outlets and components to wiring systems and to ground as indicated and instructed by manufacturer. Tighten connectors and terminals, including screws and bolts, according to equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torqueing requirements are not indicated, tighten connectors and terminals according to tightening requirements specified in UL 486A.

D. Install devices to securely and permanently fasten and support electrical components.

E. Raceway Supports:
Comply with NFPA 70 and the following requirements:

1. Conform to manufacturer's recommendations for selecting and installing supports.

2. Install individual and multiple raceway hangers and riser clamps to support raceways. Provide U bolts, clamps, attachments, and other hardware necessary for hanger assembly and for securing hanger rods and conduits.

3. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.

4. Spare Capacity:
Size supports for multiple conduits so capacity can be increased by a 25 percent minimum in the future.

5. Support individual horizontal raceways with separate, malleable iron pipe hangers or clamps.

6. Hanger Rods: 1/4-inch (6-mm) diameter or larger threaded steel, except as otherwise indicated.

7. Spring Steel Fasteners:
Specifically designed for supporting single conduits or tubing. May be used in lieu of malleable iron hangers for I-I/2-inch (38-mm) and smaller raceways serving lighting and receptacle branch circuits above suspended ceilings and for fastening raceways to channel and slotted angle supports.

8. In vertical runs, arrange support so the load produced by the weight of the raceway and the enclosed conductors is carried entirely by the conduit supports, with no weight load on raceway terminals.

F. Vertical Conductor Supports: Install simultaneously with conductors.

G. Miscellaneous Supports:
Install metal channel racks for mounting cabinets, panelboards, disconnects, control enclosures, pull boxes, junction boxes, transformers, and other devices except where components are mounted directly to structural features of adequate strength.

H. In open overhead spaces, cast boxes threaded to raceways need not be separately supported, except where used for fixture support; support sheet-metal boxes directly from the building structure or by bar hangers. Where bar hangers are used, attach the bar to raceways on opposite sides of the box and support the raceway with an approved fastener not more than 24 inches (610 mm) from the box.

I. Fire stopping:
Apply to cable and raceway penetrations of fire-rated floor and wall assemblies. Perform fire stopping as specified in Division 7 Section "Fire stopping" to reestablish the original fire resistance rating of the assembly at the penetration.

J. Fastening:
Unless otherwise indicated, securely fasten electrical items and their supporting hardware to the building structure. Perform fastening according to the following:

1. Fasten by means of wood screws or screw-type nails on wood; toggle bolts on hollow masonry units; concrete inserts or expansion bolts on concrete or solid masonry; and by machine screws, welded threaded studs," or spring tension clamps on steel.

2. Threaded studs driven by a powder charge and provided with lock washers and nuts may be used instead of expansion bolts, machine screws, or wood screws.

3. Welding to steel structure may be used only for threaded studs, not for conduits, pipe straps, or any other items.

4. In partitions of light steel construction use sheet-metal screws.

5. Select fasteners so the load applied to any fastener does not exceed 25 percent of the proof test load.

K. Install identification devices where required.

1. Install labels where indicated and at locations for best convenience of viewing without interference with operation and maintenance of equipment.

2. Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations indicated on the Contract Documents or required by codes and standards. Use consistent designations throughout the Project.

3. Self-Adhesive Identification Products: Clean surfaces of dust, loose material, and oily films before applying.

4. Identify raceways and cables of certain systems with color banding as follows:

a. Bands:
Colored adhesive marking tape. Make each color band 2 inches (51 mm) wide, completely encircling conduit, and place adjacent bands of 2-color markings in contact, side by side.

b. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25 feet (8 m) in congested areas.

c. Colors: As follows:

i. Fire-Alarm System: Red.

ii. Security System: Blue and yellow.

iii. Telecommunications System: Green and yellow.

4. Tag or label power circuits for future connection and circuits in raceways and enclosures with other circuits. Identify source and circuit numbers in each cabinet, pull box, junction box, and outlet box. Color coding may be used for voltage and phase indication.

3.4 TOUCHUP PAINTING

A. Thoroughly clean damaged areas and provide primer, intermediate, and finish coats to suit the degree of damage at each location.

B. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sleeves for raceways and cables

2. Sleeve seals

3. Grout

4. Common electrical installation requirements

1.2 SUBMITTALS

A. Product Data: For sleeve seals

PART 2 - PRODUCTS

2.1 SLEEVES FOR RACEWAYS AND CABLES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends

B. Cast Iron Pipe Sleeves:
Cast or fabricated "wall pipe," equivalent to ductile iron pressure pipe, with plain ends and integral water stop, unless otherwise indicated.

C. Sleeves for Rectangular Openings: Galvanized sheet steel

1. Minimum Metal Thickness:

a. For sleeve cross section rectangle perimeter less than 50 inches (1270 mm) and no side more than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).

b. For sleeve cross section rectangle perimeter equal to, or more than, 50 inches (1270 mm) and 1 or more sides equal to, or more than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.2 SLEEVE SEALS

A. Description:
Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.

1. Manufacturers: Subject to compliance with requirements

2. Basis of Design Product:
Subject to compliance with requirements, provide or comparable product by one of the following:

a. Advance Products & Systems, Inc.

b. Calpico, Inc.

c. Metraflex Co.

d. Pipeline Seal and Insulator, Inc.

3. Sealing Elements:
EPDM, NBR interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.

4. Pressure Plates:
Stainless steel. Include two for each sealing element.

5. Connecting Bolts and Nuts:
Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.3 GROUT

A. Nonmetallic, Shrinkage Resistant Grout:
ASTM C 1107, factory packaged, nonmetallic aggregate grout, noncorrosive, no staining, mixed with water to consistency suitable for application and a 30-minute working time.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

A. Comply with NECA l.

B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall mounting items.

C. Headroom Maintenance:
If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

D. Equipment:
Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

E. Right of Way:
Give to piping systems installed at a required slope.

3.2 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Electrical penetrations occur when raceways, cables, wire ways, cable trays, or busways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.

B. Concrete Slabs and Walls:
Install sleeves for penetrations unless core drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

D. Fire Rated Assemblies:
Install sleeves for penetrations of fire rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

E. Cut sleeves to length for mounting flush with both surfaces of walls.

F. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level.

G. Size pipe sleeves to provide l/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable, unless indicated otherwise.

H. Seal space outside of sleeves with grout for penetrations of concrete and masonry.

1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.

I. Interior Penetrations of Non-Fire Rated Walls and Floors:
Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants."

J. Fire Rated Assembly Penetrations:
Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable penetration sleeves with firestop materials. Comply with requirements in Division 07 Section "Penetration Fire stopping."

K. Roof Penetration Sleeves:
Seal penetration of individual raceways and cables with flexible boot type flashing units applied in coordination with roofing work.

L. Aboveground, Exterior Wall Penetrations:
Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for l-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

M. Underground, Exterior Wall Penetrations:
Install cast-iron pipe sleeves. Size sleeves to allow for l-inch (25-mm) annular clear space between raceway or cable and sleeve for installing mechanical sleeve seals.

3.2 SLEEVE-SEAL INSTALLATION

A. Install to seal exterior wall penetrations.

B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

END OF SECTION

SECTION 260519- LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19A & 20 KONGENS GADE, ST.THOMAS, UNITED STATES VIRGIN ISLANDS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Building wires and cables rated 600 V and less

2. Connectors, splices, and terminations rated 600 V and less

3. Sleeves and sleeve seals for cables

1.2 SUBMITTALS

A. Product Data:
For each type of product indicated.

B. Field quality control test reports.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories:
Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

A. Copper Conductors: Comply with NEMA WC 70.

B. Conductor Insulation: Comply with NEMA WC 70 for Types THW and THHN-THWN.

2.2 CONNECTORS AND SPLICES

A. Available Manufacturers:
Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AFC Cable Systems, Inc.

2. Hubbell Power Systems, Inc.

3. 0-ZJGedney; EGS Electrical Group LLC

4. 3M; Electrical Products Division

5. Tyco Electronics Corp.

B. Description:
Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.3 SLEEVES FOR CABLES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

B. Coordinate sleeve selection and application with selection and application of fire stopping specified in Division 07 Section "Penetration Fire stopping."

2.4 SLEEVE SEALS

A. Basis of Design Product:
Subject to compliance with requirements, provide or a comparable product by one of the following:

1. Advance Products & Systems, Inc.

2. Calpico, Inc.

3. Metraflex Co.

4. Pipeline Seal and Insulator, Inc.

5. Hilti, Inc.

B. Description:
Modular sealing device, designed for field assembly, to fill annular space between sleeve and cable.

1. Sealing Elements:
EPDM, NBR interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.

2. Pressure Plates: Stainless steel. Include two for each sealing element.

3. Connecting Bolts and Nuts:
Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Service Entrance: Type THW, single conductors in raceway

B. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type THHN-THWN, single conductors in raceway

C. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

B. Use manufacturer approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

C. Use pulling means, including fish tape, cable, rope, and basket weave wire/cable grips that will not damage cables or raceway.

D. Support cables according to Division 26 Sections "Hangers and Supports for Electrical Systems."

E. Identify and color code conductors and cables according to Division 26 Section "Identification for Electrical Systems."

F. Tighten electrical connectors and terminals according to manufacturer's published torque tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

G. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than un-spliced conductors.

H. Use oxide inhibitor in each splice and tap conductor for aluminum conductors.

I. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches (300 mm) of slack.

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

B. Tests and Inspections:

1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.

2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

3. Infrared Scanning:
After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each splice in cables and conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner.

a. Follow up Infrared Scanning:
Perform an additional follow-up infrared scan of each splice 11 months after date of Substantial Completion.

b. Instrument:
Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

c. Record of Infrared Scanning:
Prepare a certified report that identifies splices checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

C. Test Reports: Prepare a written report to record the following:

1. Test procedures used

2. Test results that comply with requirements

3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

D. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION

SECTION 260526- GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19A & 20 KONGENS GADE, ST.THOMAS, UNITED STATES VIRGIN ISLANDS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes methods and materials for grounding systems and equipment.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Field quality-control test reports.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories:
Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS

A. Insulated Conductors:
Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:

1. Solid Conductors: ASTM B 3

2. Stranded Conductors: ASTM B 8

3. Tinned Conductors: ASTM B 33

4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter

5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor

6. Bonding Jumper:
Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

7. Tinned Bonding Jumper:
Tinned copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

2.2 CONNECTORS

A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.

B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure type, with at least two bolts

1. Pipe Connectors: Clamp type, sized for pipe.

C. Welded Connectors:
Exothermic welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.3 GROUNDING ELECTRODES

A. Ground Rods: Copper clad steel; 3/4-inch by10 feet (19 mm by 3 m) in diameter

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors:
Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger, unless otherwise indicated.

B. Underground Grounding Conductors:
Install bare copper conductor, No. 2/0 AWG minimum. Bury at least 24 inches (600 mm) below grade.

C. Isolated Grounding Conductors:
Green colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.

D. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations:

2. Bolted connectors

3. Underground Connections: Welded connectors except at test wells and as otherwise indicated.

4. Connections to Ground Rods at Test Wells: Bolted connectors

5. Connections to Structural Steel: Welded connectors

E. Isolated Grounding Receptacle Circuits:
Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.

F. Signal and Communication Equipment:
For telephone, alarm, voice and data, and other communication equipment, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.

1. Service and Central Equipment Locations and Wiring Closets:
Terminate grounding conductor on a 1/4-by-2-by-12-inch (6-by-50-by-300-mm) grounding bus.

2. Terminal Cabinets:
Terminate grounding conductor on cabinet grounding terminal.

3. Metal Poles Supporting Outdoor Lighting Fixtures:
Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch circuit conductors.

3.2 INSTALLATION

A. Grounding Conductors:
Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Bonding Straps and Jumpers:
Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.

C. Grounding and Bonding for Piping:

1. Metal Water Service Pipe:
Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes, using a bolted clamp connector or by bolting a lug-type connector to a pipe flange, using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.

2. Water Meter Piping:

Use braided type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.

D. Bonding Interior Metal Ducts:
Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install bonding jumper to bond across flexible duct connections to achieve continuity.

3.3 FIELD QUALITY CONTROL

A. Perform the following tests and inspections and prepare test reports:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.

2. Test completed grounding system at each location where a maximum ground resistance level is specified, at service disconnect enclosure grounding terminal, and at ground test wells.

a. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.

b. Perform tests by fall of potential method according to IEEE 81.

B. Report measured ground resistances that exceed the following values:

1. Power and Lighting Equipment or System with Capacity 500 kVA and Less: 5 ohms

2. Power and Lighting Equipment or System with Capacity 500 to 1000 kVA: 3 ohms

C. Excessive Ground Resistance:
If resistance to ground exceeds specified values, notify Owner's Representative promptly and include recommendations to reduce ground resistance.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

1.2 SUBMITTALS

A. Product Data: For surface raceways, wire ways and fittings, floor boxes, hinged cover enclosures, and cabinets.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories:
Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

A. Rigid Steel Conduit: ANSI C80.1

B. IMC: ANSI C80.6

C. EMT: ANSI C80.3

D. Fittings for Conduit (Including all Types and Flexible and Liquid tight), EMT, and Cable:
NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.

1. Fittings for EMT: Steel, compression type

2.2 NONMETALLIC CONDUIT AND TUBING

A. ENT: NEMA TC 13

B. RNC: NEMA TC 2, unless otherwise indicated.

C. LFNC: UL 1660

D. Fittings for ENT and RNC: NEMA TC 3; match to conduit or tubing type and material.

E. Fittings for LFNC: UL 5l4B

2.3 METAL WIREWAYS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper B-Line, Inc.

2. Hoffman.

3. Square D; Schneider Electric

B. Description: Sheet metal sized and shaped as indicated, NEMA 250, Type l or 3R, unless otherwise indicated.

C. Fittings and Accessories:
Include couplings, offsets, elbows, expansion joints, adapters, hold down straps, end caps, and other fittings to match and mate with wire ways as required for complete system.

D. Wire way Covers: Screw cover type

E. Finish: Manufacturer's standard enamel finish

2.4 NON-METALLIC WIREWAYS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Hoffman

2. Lamson & Sessions; Carlon Electrical Products

B. Description:
PVC plastic extruded and fabricated to size and shape indicated, with snap-on cover and mechanically coupled connections with plastic fasteners.

C. Fittings and Accessories:
Include couplings, offsets, elbows, expansion joints, adapters, hold down straps, end caps, and other fittings to match and mate with wire ways as required for complete system.

2.5 SURFACE RACEWAYS

A. Surface Metal Raceways: Galvanized steel with snap-on covers. Prime coating, ready for field painting.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Thomas & Betts Corporation

b. Walker Systems, Inc.; Wiremold Company

c. Wiremold Company; Electrical Sales Division

B. Surface Non-metallic Raceways:
Two-piece construction manufactured of rigid PVC with texture and color selected by Owner's Representative from manufacturer's standard colors.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Butler Manufacturing Company; Walker Division

   b. Enduro Systems, Inc.; Composite Products Division

   c. Hubbell Incorporated; Wiring Device-Kellems Division

   d. Lamson & Sessions; Carlon Electrical Products

   e. Panduit Corp.

   f. Walker Systems, Inc.; Wiremold Company

   g. Wiremold Company (The); Electrical Sales Division

2.6 BOXES, ENCLOSURES, AND CABINETS

A. Nonmetallic Outlet and Device Boxes: NEMA OS 2.

B. Nonmetallic Floor Boxes: Nonadjustable, round

C. Small Sheet Metal Pull and Junction Boxes: NEMA OS I.

D. Hinged Cover Enclosures: NEMA 250, Type l, with continuous hinge cover with flush latch, unless otherwise indicated.

   1. Nonmetallic Enclosures: Plastic

E. Cabinets:

   1. NEMA 250, Type 1, galvanized steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.

   2. Hinged door in front cover with flush latch and concealed hinge.

   3. Metal barriers to separate wiring of different systems and voltage.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Comply with the following indoor applications, unless otherwise indicated:

   1. Exposed, Not Subject to Physical Damage: EMT

   2. Exposed, Not Subject to Severe Physical Damage: EMT

   3. Concealed in Ceilings and Interior Walls and Partitions: EMT

4. Damp or Wet Locations: Rigid steel conduit

5. Raceways for Optical Fiber or Communications Cable: EMT

6. Boxes and Enclosures: NEMA 250, Type 4, nonmetallic in damp or wet locations

G. Minimum Raceway Size: 3/4-inch (21-mm) trade size

H. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.

3.2 INSTALLATION

A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements in this Article are stricter.

B. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.

C. Raceway Terminations at Locations Subject to Moisture:
Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.

D. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire.

E. Raceways for Optical Fiber and Communications Cable: Install as follows:

1. 3/4-Inch (19-mm) Trade Size and Smaller: Install raceways in maximum lengths of 50 feet (15m).

2. l-Inch (25-mm) Trade Size and Larger: Install raceways in maximum lengths of 75 feet (23m).

3. Install with a maximum of two 90-degree bends or equivalent for each length of raceway unless Drawings show stricter requirements. Separate lengths with pull or junction boxes or terminations at distribution frames or cabinets where necessary to comply with these requirements.

F. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish like that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:

1. Where otherwise required by NFPA 70.

G. Expansion-Joint Fittings for RNC:
Install in each run of aboveground conduit that is located where environmental temperature change may exceed 30°F (17°C), and that has straight-run length that exceeds 25 feet (7.6 m).

1. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per degree Fahrenheit (0.06 mm per meter of length of straight run per degree Celsius) of temperature change.

2. Install each expansion joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at the time of installation.

H. Flexible Conduit Connections:
Use maximum of 72 inches (1830 mm) of flexible conduit for recessed and semi recessed lighting fixtures, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

1. Use LFMC in damp or wet locations subject to severe physical damage.

2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.

3.3 PROTECTION

B. Provide final protection and maintain conditions that ensure coatings and finishes are without damage or deterioration at time of Substantial Completion.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

6. Identification for raceways

7. Identification of power and control cables

8. Identification for conductors

9. Warning labels and signs

10. Instruction signs

11. Miscellaneous identification products

1.4 SUBMITTALS

A. Product Data: For each electrical identification product indicated.

1.5 QUALITY ASSURANCE

A. Comply with ANSI Al3.1.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

D. Comply with ANSI Z535.4 for safety signs and labels.

E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

PART 2 -PRODUCTS

2.1 POWER RACEWAY IDENTIFICATION MATERIALS

A. Comply with ANSI Al3.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.

B. Self-Adhesive Vinyl Labels for Raceways Carrying Circuits at 600 V or Less:
Preprinted, flexible label laminated with a clear, weather and chemical resistant coating and matching wraparound adhesive tape for securing ends of legend label.

C. Snap Around Labels for Raceways Carrying Circuits at 600 V or Less:
Slit, pre-tensioned, flexible, pre-printed, color coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

D. Snap Around, Color Coding Bands for Raceways Carrying Circuits at 600 V or Less:
Slit, pre-tensioned, flexible, solid colored acrylic sleeve, 2 inches (50 mm) long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

E. Write On Tags:
Polyester tag, 0.010 inch (0.25 mm) thick, with corrosion resistant grommet and cable tie for attachment to conductor or cable.

1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

2.2 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Self-Adhesive Vinyl Labels:
Preprinted, flexible label laminated with a clear, weather and chemical resistant coating and matching wrap around adhesive tape for securing ends of legend label.

C. Write On Tags:
Polyester tag, 0.010 inch (0.25 mm) thick, with corrosion resistant grommet and cable tie for attachment to conductor or cable.

1. Marker for Tags:
Permanent, waterproof, black ink marker recommended by tag manufacturer.

D. Snap Around Labels:
Slit, pre-tensioned, flexible, preprinted, color coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

E. Snap Around, Color Coding Bands:
Slit, pre-tensioned, flexible, solid colored acrylic sleeve, 2 inches (50 mm) long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

2.3 CONDUCTOR IDENTIFICATION MATERIALS

A. Color Coding Conductor Tape:
Colored, self-adhesive vinyl tapes not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide.

B. Self-Adhesive Vinyl Labels:
Preprinted, flexible label laminated with a clear, weather and chemical resistant coating and matching wraparound adhesive tape for securing ends of legend label.

C. Marker Tapes:
Vinyl or vinyl cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

D. Write On Tags:

Polyester tag, 0.010 inch (0.25 mm) thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.

1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

2.4 WARNING LABELS AND SIGNS

A. Comply with NFPA 70 and 29 CFR 1910.145.

B. Self-Adhesive Warning Labels:
Factory printed, multicolor, pressure sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.

C. High Density Polyethylene (HDPE) Warning Signs:

1. Preprinted Dual Color Routed HDPE signs punched or drilled for fasteners, with colors, legend, and size required for application.

2. 1/4-inch (6.4-mm) grommets in corners for mounting.

3. Nominal size, 7 by 10 inches (180 by 250 mm).

D. Warning label and sign shall include, but are not limited to, the following legends:

1. Multiple Power Source Warning:
"DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."

2. Workspace Clearance Warning:
"WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES (915 MM)."

2.5 INSTRUCTION SIGNS

A. Routed, Dual Color HDPE, minimum 1/2-inch-thick for signs up to 20 sq. inches (129 sq. m) and 3/4-inch-thick for larger sizes.

1. Routed legend with black letters on white face.

2. Punched or drilled for mechanical fasteners.

3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.6 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint:
Comply with requirements in Division 09 painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs:
Self-tapping, stainless steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Location:
Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

B. Apply identification devices to surfaces that require finish after completing finish work.

C. Self-Adhesive Identification Products:
Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

D. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.

E. System Identification Color Coding Bands for Raceways and Cables:
Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (7.6-m) maximum intervals in congested areas.

F. Painted Identification:
Comply with requirements in Division 09 painting Sections for surface preparation and paint application.

3.2 IDENTIFICATION SCHEDULE

A. Accessible Raceways and Metal Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30 A, and 120 V to ground:
Install labels at 10-foot (3-m) maximum intervals.

B. Accessible Raceways and Cables within Buildings:
Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:

1. Emergency Power

2. Power

3. UPS

C. Power Circuit Conductor Identification, 600 V or Less:

For conductors in vaults, pull and junction boxes, manholes, and hand holes, use color-coding conductor tape to identify the phase.

1. Color Coding for Phase and Voltage Level Identification, 600 V or Less:
Use colors listed below for ungrounded service feeder and branch-circuit conductors.

a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.

b. Colors for 208/120-V Circuits:

i. Phase A: Black

ii. Phase B: Red

iii. Phase C: Blue

c. Colors for 480/277-V Circuits:

i. Phase A: Brown

ii. Phase B: Orange

iii. Phase C: Yellow

D. Install instructional sign including the color code for grounded and ungrounded conductors using adhesive film type labels.

E. Conductors to Be Extended in the Future:
Attach write on tags or marker tape to conductors and list source.

F. Auxiliary Electrical Systems Conductor Identification:
Identify field installed alarm, control, and signal connections.

1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.

2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory installed connections.

3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.

G. Workspace Indication:
Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CPR 1926.403 unless otherwise indicated. Do not install at flush mounted panelboards and similar equipment in finished spaces.

H. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels

1. Comply with 29 CPR 1910.145.

2. Identify system voltage with black letters and an orange background.

3. Apply to exterior of door, cover, or other access.

I. Operating Instruction Signs:
Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.

J. Emergency Operating Instruction Signs:
Install instruction signs with white legend and a red background with minimum 3/8-inch (10-mm) high letters for emergency instructions at equipment used for power transfer.

K. Equipment Identification Labels:
On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:

a. Indoor Equipment:
Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch (13-mm) high letters on 1-l/2-inch (38-mm) high label; where two lines of text are required, use labels 2 inches (50 mm) high.

b. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.

c. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

2. Equipment to Be Labeled:

a. Panelboards:
Typewritten directory of circuits in the location provided by panel board manufacturer. Panel board identification shall be self-adhesive, engraved, laminated acrylic or melamine label.

b. Enclosures and electrical cabinets

c. Access doors and panels for concealed electrical items

d. Switchboards

e. Emergency system boxes and enclosures

f. Enclosed switches

g. Enclosed circuit breakers

h. Enclosed controllers

i. Monitoring and control equipment

j. UPS equipment

END OF SECTION

PART 1 -·GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Receptacles, receptacles with integral GFCI, and associated device plates.

2. Wall switch and exterior occupancy sensors.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated

B. Shop Drawings: List of legends and description of materials and process used for pre-marking wall plates.

C. Operation and Maintenance Data:
For wiring devices to include in all manufacturers' packing label warnings and instruction manuals that include labeling conditions.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories:
Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers' Names:
Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:

1. Cooper Wiring Devices; a division of Cooper Industries, Inc. (Cooper)

2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell)

3. Leviton Mfg. Company Inc. (Leviton)

4. Pass & Seymour/Legrand; Wiring Devices & Accessories (Pass & Seymour)

2.2 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories:
Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

C. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:

1. Connectors shall comply with UL 2459 and shall be made with stranded building wire.

2. Devices shall comply with the requirements in this Section.

D. All 125V and 250V, 20A receptacles shall be listed as weather resistant type per 2008 NEC 406.8, Receptacles in Damp and Wet Locations.

2.3 STRAIGHT BLADE RECEPTACLES

A. Convenience Receptacles, 125 V, 20 A:
Comply with NEMA WD I, NEMA WD 6 configuration 5-20R, and UL498.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Cooper; 5351 (single), 5352 (duplex)

b. Hubbell; HBL5351 (single), CR5352 (duplex)

c. Leviton; 5891 (single), 5352 (duplex)

d. Pass & Seymour; 5381 (single), 5352 (duplex)

2.4 GFCI RECEPTACLES

A. General Description:
Straight blade, non-feed through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, and UL 943, Class A, and include indicator light that is lighted when device is tripped.

B. Duplex GFCI Convenience Receptacles, 125 V, 20 A:

1. Available Products:
Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

a. Cooper; GF20

b. Pass & Seymour; 2084

2.5 SNAP SWITCHES

A. Comply with NEMA WD 1 and UL 20.

B. Switches, 120/277 V, 20 A:

1. Products: Subject to compliance with requirements, provide one of the following:

a. Cooper: 2221 (single pole), 2222 (two pole), 2223 (three way), 2224 (four way)

b. Hubbell: CS122l (single pole), CS1222 (two pole), CS1223 (three way), CS1224 (four way)

c. Leviton: 1221-2 (single pole), 1222-2 (two pole), 1223-2 (three way), 1224-2 (four way)

d. Pass & Seymour: 20ACl (single pole), 20AC2 (two pole), 20AC3 (three way), 20AC4 (four way)

C. Single Pole, Double Throw, Momentary Contact, Center Off Switches, 120/277 V, 20 A; for use with mechanically held lighting contactors.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Cooper: 1995

b. Hubbell: HBL1557

c. Leviton: 1257

d. Pass & Seymour: 1251

2.6 WALL PLATES

A. Single and combination types to match corresponding wiring devices.

1. Plate Securing Screws: Metal with head color to match plate finish.

2. Material for Finished Spaces: Smooth, high-impact thermoplastic.

3. Material for Unfinished Spaces: Smooth, high-impact thermoplastic.

4. Material for Damp Locations: Thermoplastic with spring loaded lift cover, and listed and labeled for use in "wet locations."

2.7 FINISHES

B. Color: TBD by the Owner's Representative. Plates and screw heads shall match device color.

1. Wiring Devices Connected to Normal Power System:
White, unless otherwise indicated or required by NFPA 70 or device listing

2. Wiring Devices Connected UPS Power System: Red

3. TVSS Devices: Blue.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.

B. Coordination with Other Trades:

1. Take steps to ensure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.

2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.

3. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until just before they are spliced or terminated on devices.

2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.

3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.

D. Device Installation:

1. Replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete.

2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.

3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.

4. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.

5. Use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.

6. Use a torque screwdriver when a torque is recommended or required by the manufacturer.

7. When conductors larger than No. 12 AWG are installed on 15 or 20-A circuits, splice No. 12 AWG pigtails for device connections.

8. Tighten unused terminal screws on the device.

9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.

10. Every room shall have lighting control device whether indicated or not on plans.

11. Install a motor rated service switch at each connection to 120V fan motors whether indicated or not on plans.

12. Coordinate device mounting with Architectural drawings prior to rough-in.

13. Device and Plate Color:

a. White: Devices connected to Normal Power Circuit.

b. Gray: Device connected to UPS Power Circuit.

c. Red: Devices connected to Emergency Power Circuit.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the right.

F. Device Plates:
Do not use oversized or extra deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Dimmers:

1. Install dimmers within terms of their listing.

2. Verify that dimmers used for fan speed control are listed for that application.

3. Install unshared neutral conductors online and load side of dimmers according to manufacturers' device listing conditions in the written instructions.

H. Arrangement of Devices:

1. Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top.

2. Group adjacent switches under single, multi-gang wall plates.

3. Align vertically receptacles, light switches and fire alarm devices when shown near each other.

3.2 IDENTIFICATION

A. Comply with Division 26 Section "Identification for Electrical Systems."

1. Receptacles:
Identify panelboard and circuit number from which served. Use hot, stamped or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

1. Test Instruments: Use instruments that comply with UL 1436.

2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated LED indicators of measurement.

B. Tests for Convenience Receptacles:

1. Line Voltage: Acceptable range is 105 to 132V.

2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is not acceptable.

3. Ground Impedance: Values of up to 2 ohms are acceptable.

4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943

5. Using the test plug, verify that the device and its outlet box are securely mounted.

6. The tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions remove malfunctioning units and replace with new, and retest as specified above.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes interior lighting fixtures, lamps, ballasts, emergency lighting units, and accessories.

1.3 DEFINITIONS

A. Emergency Lighting Unit:
A fixture with integral emergency battery powered supply and the means for controlling and charging the battery. It is also known as an emergency light set.

B. Fixture:
A complete lighting unit, exit sign, or emergency lighting unit. Fixtures include lamps and parts required to distribute light, position and protect lamps, and connect lamps to power supply. Internal battery powered exit signs and emergency lighting units also include a battery and the means for controlling and recharging the battery. Emergency lighting units include ones with and without integral lamp heads.

C. Average Life: The time after which 50 percent fails and 50 percent survives under normal conditions.

1.4 SUBMITTALS

A. General:
Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data describing fixtures, lamps, ballasts, and emergency lighting units. Arrange Product Data for fixtures in order of fixture designation. Include data on features and accessories and the following:

1. Outline drawings indicating dimensions and principal features of fixtures.

2. Electrical Ratings and Photometric Data: Certified results of independent laboratory tests for fixtures and lamps.

3. Battery and charger data for emergency lighting units.

C. Maintenance data for fixtures to include in the operation and maintenance manual specified in Division.

1.5 QUALITY ASSURANCE

A. Electrical Component Standard:

Provide components that comply with NFPA 70 and that are listed and labeled by UL where available.

B. Listing and Labeling:
Provide fixtures, emergency lighting units, and accessory components specified in this Section that are listed and labeled for their indicated use and installation conditions on Project. The Terms "Listed" and "Labeled" as defined in the National Electrical Code, Article 100.

1. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

C. Coordinate fixtures, mounting hardware, and trim with ceiling system and other items, including work of other trades, required to be mounted on ceiling or in ceiling space.

1.6 WARRANTY

A. General Warranty:
The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.

1. Lamps: 10 lamps for every 100 of each type and rating installed. Furnish at least one of each type.

2. Ballasts: 1 for every 100 of each type and rating installed. Furnish at least one of each type.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products:
Subject to compliance with requirements, provide one of the products specified in each Interior Lighting Fixture Schedule as indicated on the drawings.

2.2 FIXTURES AND FIXTURE COMPONENTS, GENERAL

A. Metal Parts: Free from burrs, sharp comers, and edges.

B. Sheet Metal Components: Steel, except as indicated. Form and support to prevent warping and sagging.

C. Doors, Frames, and Other Internal Access:
Smooth operating, free from light leakage under operating conditions, and arranged to permit re-lamping without use of tools. Arrange doors, frames, lenses, diffusers, and other pieces to prevent accidental falling during re-lamping and when secured in operating position.

D. Reflecting Surfaces: Minimum reflectance as follows, except as otherwise indicated:

1. White Surfaces: 85 percent

2. Specular Surfaces: 83 percent

3. Diffusing Specular Surfaces: 75 percent

4. Laminated Silver Metallized Film: 90 percent

E. Lens glasses, Diffusers, Covers, and Globes: 100 percent virgin acrylic plastic or water white, annealed crystal s, except as otherwise indicated.

1. Lens Thickness: 0.125-inch (3 mm) minimum; except where greater thickness is indicated.

2. Plastic: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.

F. Fixture Support Components: Comply with Division 26 Section "Basic Electrical Materials and Methods."

1. Single-Stem Hangers:
1/2-inch (12-mm) steel tubing with swivel ball fitting and ceiling canopy. Finish same as fixture.

2. Twin-Stem Hangers:
Two, 1/2-inch (12-mm) steel tubes with single canopy arranged to mount a single fixture. Finish same as fixture.

3. Rod Hangers: 3/16-inch (5-mm) minimum diameter, cadmium-plated, threaded steel rod

4. Hook Hanger:
Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

G. Fluorescent Fixtures: Conform to UL 1570.

H. Fluorescent Ballasts:
Electronic integrated circuit, solid-state, full-light-output, energy-efficient type compatible with lamps and lamp combinations to which connected.

1. Certification by Electrical Testing Laboratory (ETL).

2. Labeling by Certified Ballast Manufacturers Association (CBM).

3. Type: Class P, high power factor, except as otherwise indicated

4. Sound Rating: "A" rating, except as otherwise indicated

5. Voltage: Match connected circuits

6. Lamp Flicker: Less than 5 percent.

7. Minimum Power Factor: 90 percent

8. Total Harmonic Distortion (THD) of Ballast Current: Less than 20 percent

9. Conform to FCC Regulations Part 15, Subpart J for electromagnetic interference.

10. Conform to IEEE C62.41, Category A, for resistance to voltage surges for normal and common modes.

11. Multi-lamp Ballasts: Use 2, 3, or 4 lamp ballasts for multi-lamp fixtures where possible.

12. Lamp-ballast connection method does not reduce normal rated life of lamps.

I. Exit Signs: Conform to UL 924 and the following:

1. Sign Colors: Conform to local code.

2. Minimum Height of Letters: Conform to local code

3. Arrows: Include as indicated

4. Lamps for AC Operation: Light-emitting diodes (LED), 70,000 hours minimum rated life

J. Emergency Lighting Units: Conform to UL 924. Provide self-contained units with the following features:

1. Battery:
Sealed, maintenance-free, lead-calcium type with minimum 10-year nominal life and special warranty.

2. Charger: Minimum 2-rate, fully automatic, solid-state type, with sealed transfer relay.

3. Operation:
Relay automatically turns lamp on when supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. Relay disconnects lamps and battery and automatically recharges and floats on trickle charger when normal voltage is restored.

2.3 LAMPS

A. Comply with ANSI C78 series that is applicable to each type of lamp.

B. Fluorescent Color Temperature and Minimum Color-Rendering Index (CRI): 4800 K and 85 CRI, except as otherwise indicated.

2.4 FINISHES

A. Manufacturer's standard, except as otherwise indicated, applied over corrosion resistant treatment or primer, free of streaks, runs, holidays, stains, blisters, and similar defects.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Set units plumb, square, and level with ceiling and walls, and secure according to manufacturer's written instructions and approved Shop Drawings. Support fixtures according to requirements of Division 26 Section "Basic Electrical Materials and Methods."

B. Support for Recessed and Semi-recessed Grid Type Fluorescent Fixtures:
Units may be supported from suspended ceiling support system. Install ceiling support system rods or wires at a minimum of 4 rods or wires for each fixture, located not more than 6 inches (150 mm) from fixture comers.

1. Install support clips for recessed fixtures, securely fastened to ceiling grid members, at or near each fixture comer.

2. Fixtures Smaller than Ceiling Grid:

3. Install a minimum of 4 rods or wires for each fixture and locate at comer of ceiling grid where fixture is located. Do not support fixtures by ceiling acoustical panels.

4. Fixtures of Sizes Less than Ceiling Grid:
Center in acoustical panel. Support fixtures independently with at least two 3/4-inch (20-mm) metal channels spanning and secured to ceiling tees.

C. Lamping: Where specific lamp designations are not indicated, lamp units according to manufacturer's instructions.

3.2 CONNECTIONS

A. Ground lighting unit:
Tighten electrical connectors and terminals, including grounding connections, according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.3 FIELD QUALITY CONTROL

A. Inspect each installed fixture for damage. Replaced damaged fixtures and components.

B. Give advance notice of dates and times for field tests.

C. Provide instruments to make and record test results.

D. Tests:
Verify normal operation of each fixture after fixtures have been installed and circuits have been energized with normal power source. Interrupt electrical energy to demonstrate proper operation of emergency lighting installation. Include the following information in tests of emergency lighting equipment:

1. Duration of supply.

2. Low battery voltage shutdown.

3. Normal transfer to battery source and retransfer to normal.

4. Low supply voltage transfer.

E. Replace or repair malfunctioning fixtures and components, then retest. Repeat procedure until all units operate properly.

F. Report results of tests.

G. Replace fixtures that show evidence of corrosion during Project warranty period.

3.4 ADJUSTING AND CLEANING

A. Clean fixtures after installation. Use methods and materials recommended by manufacturer.

B. Adjust aimed fixtures to provide required light intensities.

END OF SECTION

PART 1 GENERAL

1.1 INTRODUCTION

C. The United States Virgin Islands Telecommunications Specifications, hereinafter referred to as VITS, shall be used by Virgin Islands Agencies, Architects, Design Engineers and Low Voltage Telecommunications Contractors (LVLTC) for the design and construction of all Information Transport Systems installed in Territory facilities. VITS is based upon the most current available literature, codes, standards and industry accepted practices available at the time of publication.

D. The VITS establishes a strategic direction for the physical connection of communications devices in US Virgin Islands facilities. A properly designed and constructed telecommunications system shall be adaptable to change over the life of the building.

E. The design and construction of the telecommunications system shall:

1. Provide telecommunications architecture based on recognized standards to support efficient, long-lasting, cost-effective operations.

2. Reduce the amount of time required to install new networks or to reconfigure existing local area networks.

3. Provide the flexibility to operate multiple high bandwidth technologies on a single structured cabling system.

4. Eliminate the cost of installing non-standard, proprietary, vendor-specific cabling by providing standards-based cabling systems that will support a wide variety of equipment.

5. Improve network manageability and facilitate automated cabling system management through the use of uniform and industry standard identification and numbering schemes.

6. Allow for the growth of high speed, high bandwidth Local Area Networks (LANs) and Wide Area Networks (WANs) that may be required by future specialized applications.

1.2 STANDARDS:

A. Effective telecommunications and networking can only be accomplished by adherence to standards. Additionally, cabling infrastructure costs cannot be contained without adherence to sound installation and management practices. To ensure that the future telecommunications and connectivity needs of agencies are met in a cost-effective manner, the VITS confirms the US Virgin Island's support for ANSI/TIA/EIA and IEEE standards for telecommunications.

B. American National Standards Institute (ANSI) approves standards as having been properly developed.

C. ANSI/TIA/EIA-526, Optical Fiber Systems Test Procedures.

D. ANSI/TIA/EIA-568, Commercial Building Telecommunications Cabling Standard.

E. ANSI/EIA/TIA-569, Commercial Building Standard for Telecommunications Pathways and Spaces.

F. ANSI/TIA/EIA-606A, Administration Standard for the Telecommunications Infrastructure of Commercial Buildings.

G. ANSI/TIA/EIA-607, Commercial Building Grounding and Bonding Requirements for Telecommunications.

H. IEEE 802.3, Local Area Network Ethernet Standard.

I. Building Industry Consulting Service International, Inc. (BICSI) Telecommunications Distribution Methods Manual (TDMM).

J. NFPA 70, National Electrical Code, Article 250, Grounding; Article 645, Information Technology Equipment; Article 770, Optical Fiber Cables and Raceways; Chapter 8, Communications Systems.

K. The VITS provides the minimum recommendations for telecommunications in Territory facilities. The VITS addresses the physical pathways, media and cable administration practices.

1.3 STRUCTURED CABLING SYSTEM (SCS):

A. The US Virgin Islands requires following the general cabling industry practice of using an SCS. Other cabling systems may be installed in addition to the SCS, but as a minimum the Territory requires that a SCS be installed. A properly designed SCS allows the designer and LVLTC to fulfill the telecommunications needs without knowing specifically what electronic equipment will be utilized. The SCS is geared for long-term stability and flexibility and is based on the idea of cabling buildings once. The SCS approach allows the cable and telecommunications outlets to remain unchanged as connections and services vary.

B. There are typically eight major components of the SCS as follows:

1. Service Entrance Facilities
2. Main Equipment Room
3. Telecommunications Room
4. Backbone Cabling
5. Horizontal Cabling
6. Work Area Outlets
7. Grounding and Bonding
8. Administration and Labeling.

1.4 SCOPE:

C. The US Virgin Islands requires a uniform cabling plan in each building for voice, data, image, and video distribution to allow for flexible changes, office renovations, equipment migrations and constant upgrades. This cabling system shall be based on industry standard SCS's that are not proprietary and conform to current ANSI/TIA/EIA Commercial Cabling Standards.

1.5 QUALIFICATIONS:

A. Telecommunications Installer:

1. The telecommunications installation contractor shall be licensed in the US Virgin Islands as a Telecommunications Class or Unrestricted Class Low-Voltage Licensed (LVL) Contractor.

2. The Low-Voltage Licensed Telecommunications Contractor (LVLTC) shall be based in the US Virgin Islands.

B. The installation of cable, equipment, terminations and associated services shall be performed by a company that is currently a Manufacturer's Certified Structured Cabling System installer in good standing with minimum of (5) years of experience on similar systems.

C. The installation company shall have a Regional Communications Distribution Designer (RCDD) on staff performing the role of Project Manager, be available for consultation and attend project meetings.

D. A LVLTC and BICSI certified installer shall be contracted directly by the General Contractor and be on-site as the installation manager. **The electrical contractor shall not perform or share the telecommunications work or subcontract the work to a LVLTC.**

E. The LVLTC Project Manager shall act as a single point of contact for activities regarding this project. The Project Manager shall be required to make on-site decisions regarding the scope of the work and changes required by the work. The Project Manager shall be the jobsite whenever work is being performed or workers are present.

F. The Project Manager shall notify the appropriate BIT/RCDD, telecommunications system designer and the Agency's Inspector of change requests and inspections. Final approval for change requests must be obtained prior to commencement of work. Scheduling and coordinating inspections between the LVLTC, the BIT/RCDD and the Agency's Inspector is critical.

G. The selected LVLTC shall be fully capable and experienced in the installation of telecommunications distribution systems and have a minimum of five (5) years of experience installing SCS's. To ensure the system has continued support, the Territory/BIT/Agency will contract only with a LVLTC having a successful history of SCS installations.

H. The LVLTC shall have an RCDD on staff that will ultimately be responsible for this project. The RCDD shall have enough experience in this type project and be able to lend adequate technical support to the field forces during installation, during the warranty period and extended warranty periods or maintenance contracts. The credentials (current BICSI certification stamp) of the responsible RCDD must be attached to the Specifications response for evaluation by the Territory/Agency/BIT. The Territory/Agency/BIT reserves the right to require the LVLTC to assign another RCDD whom, in the Territory/Agency/BIT's opinion, possesses the necessary skills and experience required.

I. The Territory may, with full cooperation of the LVLTC, visit installations to observe equipment operations and consult with references. Specified visits and discussion shall be arranged through the LVLTC; however, the LVLTC personnel shall not be present during discussions with references. The LVLTC must provide a minimum of three (3) reference accounts at which similar work, both in scope and design, have been completed by the LVLTC within the last two (2) years.

J. In the event multiple Vendors submit a joint response, a single Vendor shall be identified as the Prime Vendor. Prime Vendor responsibilities shall include performing overall project administration and serving as a focal point for the Territory to coordinate and monitor plans, schedules status information and administer changes required. The Prime Vendor shall remain responsible for performing tasks associated with installation and implementation of the entire telecommunications project.

1.6 QUALITY ASSURANCE:

A. The LVLTC shall install work in accordance with the latest VITS and the latest BICSI Cabling Installation Manual.

B. The Owner's Representative is responsible for coordinating the required inspections found in the VITS.

1.7 SUBMITTALS:

A. The LVLTC shall submit shop drawings and product data to the BIT/RCDD and designer for review and approval prior to commencement of work.

B. The LVLTC shall indicate installation details, cable routing, system configuration, and outlet numbering on shop drawings.

C. The LVLTC shall submit appropriate product data for each component to be supplied.

D. The LVLTC shall submit manufacturer's installation instructions.

E. The LVLTC shall submit three copies of a complete, bound, project record manual consisting of the following:

1. Product cut sheets for products supplied.

2. Test reports for horizontal cabling.

3. Test reports for backbone cabling.

4. Manufacturer's warranties.

5. "D-size" As-built drawings.

F. The As-built drawings shall accurately record location of service entrance conduit, termination backboards, outlet boxes, cable raceways, cable trays, pull boxes, and equipment racks electronically using AutoCAD's latest version and on a minimum "D" size reproducible paper print.

G. The LVLTC shall prepare 11" x 17" as-built serving zone drawings for each TR. The drawings shall be laminated, framed and secured to the wall in the MER and TR.

1.8 WARRANTIES:

A. The LVLTC shall furnish a manufacturer's warranty of products, applications and workmanship for 15 years from the date of acceptance by the Territory. Products and workmanship shall carry warranties equal to or greater than the warranty from the date of acceptance by the Territory.

B. Materials and workmanship shall be fully guaranteed by the LVLTC for 15 years from transfer of title against defects. The defects which may occur, as the result of faulty materials or workmanship within 15 years after installation and acceptance by the Agency shall be corrected by the LVLTC at no additional cost to the Agency.

C. The LVLTC shall promptly, at no cost to the Agency, correct or re-perform (including modifications or additions as necessary) nonconforming or defective work within 25 years after completion of the project.

D. The LVLTC shall procure equipment and materials that carry warranties against defects and workmanship whenever available. The LVLTC shall transfer to the Agency Owner additional warranties offered by the manufacturers, at no additional costs to the Agency.

E. The LVLTC's obligation under its warranty is limited to the cost of repair of the warranted item or replacement thereof, at the LVLTC's option. Insurance covering said equipment from damage or loss is to be borne by the LVLTC until full acceptance of equipment and services.

1.9 VIRGIN ISLANDS BUREAU OF TECHNOLOGY (BIT):

A. The US Virgin Islands is the owner of property and completed projects, unless otherwise specified in the project.

B. The BIT is responsible for telecommunications systems in Territory owned or leased buildings.

C. BIT is represented by regional BIT/Registered Communications Distribution Designers (BIT/RCDD) during the design and construction of facilities for the Territory. The RCDD will assist the design team and the other trade representatives throughout the design and construction process.

D. BIT reserves the right to send their RCDD as representative to attend construction meetings.

E. The BIT/RCDD shall help resolve issues concerning the telecommunications infrastructure during design and construction.

F. BIT reserves the right to send its BIT/RCDD as a representative to inspect the job site during construction to ensure compliance with the VITS and associated telecommunications codes and standards.

G. The BIT/RCDD shall be included in phases of the project from the first preliminary meeting to the final walk-through, including each architectural, engineering, and construction phase.

H. The BIT/RCDD shall provide input to the design and implementation of the telecommunications infrastructure.

I. The BIT/RCDD shall provide final approval of the details of the Specifications and Drawings for the voice, data, and video cabling recommendations at each phase and milestone of the project.

J. The BIT/RCDD shall serve as a single point of contact for coordinating and provisioning of telecommunications service entrances for each facility and for other associated tasks required for service and support provided through BIT.

1.10 REGULATORY CODES AND STANDARDS

A. Regulatory Agencies
Currently, the following agencies and their codes, standards and regulations shall govern all telecommunications work performed for the US Virgin Islands.

Acronym	Organization	Web Site
ANSI	American National Standards Institute	www.ansi.org
ASTM	American Society for Testing Materials	www.astm.org
BICSI	Building Industry Consulting Service International	www.bicsi.org
BOCA	Building Officials and Code Administrators International, Inc.	www.bocai.org
EIA	Electronic Industries Alliance	www.eia.org
EPA	Environmental Protection Agency	www.epa.gov
FCC	Federal Communications Commission	www.fcc.org
ICEA	Insulated Cable Engineers Association, Inc.	www.icea.net
IEEE	Institute of Electrical and Electronic Engineers, Inc	www.ieee.org
IEC	International Electro-technical Commission	www.iec.ch
ISO	International Organization for Standardization	www.iso.ch
NEMA	National Electrical Manufacturers Association	www.nema.org
NFPA	National Fire Protection Association	www.nfpa.org
NEC (NFPA 70)	National Electrical Code	www.nfpa.org
OSHA	Occupational Safety and Hazard Administration	www.osha.gov
SCTE	Society of Cable Telecommunications Engineers	www.scte.org
RUS	Rural Utilities Services	www.rurdev.usda.gov/rus/
TIA	Telecommunications Industry Association	www.tiaonline.org
UL	Underwriters Laboratories	www.ul.com

B. National Electrical Code, NFPA 70

1. The National Fire Protection Association has acted as the sponsor of the National Electrical Code (NEC) since 1911. The original Code was developed in 1897 as a result of the united efforts of various insurance, electrical, architectural, and allied interests. The purpose of the NEC is the practical safeguarding of persons and property from hazards arising from the use of electricity. The NEC provides the minimum code requirements for electrical safety. In telecommunications distribution design, the NEC must be used in concert with the ANSI/EIA/TIA standards, which are intended to insure the performance of the telecommunications infrastructure.

2. The National Electrical Code is available from**:** National Fire Protection Association, 1 Batterymarch Park, PO Box 9101, Quincy, MA 02269-9904

C. ANSI/TIA/EIA Standards

1. The Telecommunications Industry Association/Electronics Industry Association (ANSI/TIA/EIA) engineering standards and publications are designed to serve the public interest by eliminating misunderstandings between manufacturers and purchasers. The standards facilitate interchangeability and improvement of products and assist the purchaser in selecting and obtaining the proper product for his need.

2. ANSI/TIA/EIA Standards are updated every 5 years. Due to the rapid changes in the telecommunications and electronics industries, ANSI/TIA/EIA publishes periodic Telecommunications System Bulletins (TSB) which provides additional guidance on technical issues that must be addressed prior to the next scheduled revision of the Standards. The information contained in TSBs is usually incorporated into the applicable Standard during the next Standard revision.

D. ANSI/TIA/EIA Standards are available from: Global Engineering Documents, 15 Inverness Way East Englewood, CO 80112-5704, 1-800-624-3974

E. Optical Fiber Systems Test Procedures, ANSI/TIA/EIA-526 (series)
ANSI/TIA/EIA-526 contains a series of test procedures developed to provide uniform procedures for testing all or part of optical fiber systems or subsystems intended for optical communications or data transmission use. The base document is ANSI/TIA/EIA-526.

F. Cabling Standard, ANSI/TIA/EIA-568 (series)

1. The ANSI/TIA/EIA-568 (series) is the Commercial Building Telecommunications Cabling Standard. This standard defines a generic telecommunications cabling system for commercial buildings that will support a multi-product, multi-vendor environment. It also provides direction for the design of telecommunications products for commercial enterprise.

2. The purpose of the standard is to enable planning and installation of building cabling with little knowledge of the telecommunications products that subsequently will be installed. Installation of cabling systems during building construction or renovation is significantly less expensive and less disruptive than after the building is occupied. ANSI/TIA/EIA-568 establishes performance and technical criteria for various cabling system configurations for interfacing and connecting their respective elements.

G. Pathways and Spaces, ANSI/EIA/TIA-569 (series)

1. The ANSI/EIA/TIA-569 (series) is the Commercial Building Standard for Telecommunications Pathways and Spaces. This standard recognizes three fundamental concepts related to telecommunications and buildings

   a. Buildings are dynamic.

      i. Over the life of a building, or campus, remodeling is more the rule than the exception. The standard recognizes that changes will take place.

   b. Building telecommunications systems and media are dynamic.

      i. Over the life of a building, or campus, both telecommunications equipment and cabling requirements change dramatically. The standard recognizes this fact by being as independent as possible from specific vendor equipment and media.

   c. Telecommunications is more than just voice and data connectivity.

2. Telecommunications also encompasses many other building systems including environmental controls, security, audio, television, sensing, alarms and paging.

3. Telecommunications includes all low voltage signal systems that convey information within or between buildings.

4. In order to have a building, or campus, successfully designed, constructed, and provisioned for telecommunications, it is imperative that the telecommunications design be incorporated during the preliminary architectural design phase. To accomplish this, the architect must work closely with the designated GVI/RCDD; and the Agency's Facilities Coordinator.

H. Administration Standard, ANSI/TIA/EIA-606 (series)
The ANSI/TIA/EIA-606 (series) is the Administration Standard for the Telecommunications Infrastructure of Commercial Buildings. Administration of the telecommunications infrastructure includes documentation of cables, termination hardware, patching and cross-connection facilities, conduits, other cable pathways, telecommunications rooms, and other telecommunications spaces. The purpose of this standard is to provide a uniform administration scheme that is independent of applications, which may change several times throughout the life of a building. This standard establishes guidelines for owners, end users, manufacturers, installers, and facilities administrators involved in the administration of the telecommunications infrastructure.

I. Grounding and Bonding, ANSI/J-STD-607 (series)
The ANSI/J-STD-607 (series) is the Commercial Building Grounding and Bonding Requirements for Telecommunications. The National Electrical Code (NEC) provides grounding, bonding, and electrical protection requirements to ensure life safety. Modern telecommunications systems require an effective grounding infrastructure to ensure optimum performance of the wide variety of electronic information transport systems that may be used throughout the life of a building. The grounding and bonding requirements of this standard are additional technical requirements for telecommunications that are beyond the scope of the NEC. These standards are intended to work in concert with the cabling topology specified in ANSI/TIA/EIA-568 and installed in the pathways and spaces designed in accordance with ANSI/TIA/EIA-569.

J. Local Area Network Ethernet Standard, IEEE 802.3 (series)
The US Virgin Islands typically utilizes the Ethernet LAN protocol at all facilities. All US Virgin Islands telecommunications infrastructure must be designed to support the Institute of Electrical and Electronic Engineers (IEEE) Ethernet 802.3 standards. Most State organizations are in the process of migrating to the 1000Base-X Gigabit Ethernet protocol based on the IEEE 802.3z standard. All newly installed cabling shall support this protocol. Careful consideration must be given to the multimode optical fiber distance limitations and signal loss limitations (less than 2.5 dB end-to-end) necessary to support the IEEE 802.3z protocol.

K. BICSI Telecommunications Distribution Methods Manual
BICSI is an ITS Association whose mission is to provide state-of-the-art telecommunications knowledge to the industry, resulting in good service to the end user. BICSI develops and publishes the Telecommunications Distribution Methods Manual (TDMM). The TDMM is not a code or standard. The TDMM is an extensive volume of information on the various aspects of telecommunications systems and telecommunications distribution. The TDMM provides discussions and examples of various engineering methods and design solutions that can be selected and employed in order to meet the requirements of the NEC and ANSI/TIA/EIA standards.

L. Additional BICSI Publications:

1. BICSI -- Cabling Installation Manual

2. BICSI -- LAN Design Manual

3. BICSI – Customer-Owned OSP Design Manual

M. BICSI publications are available from:
BICSI, 8610 Hidden River Parkway, Tampa, FL 33637-1000 1-800-242-7405

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

SECTION 270500 – COMMON WORK RESULTS FOR COMMUNICATIONS

GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19A & 20 KONGENS GADE, ST.THOMAS, UNITED STATES VIRGIN ISLANDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Communications equipment coordination and installation.
2. Sleeves for pathways and cables.
3. Sleeve seals.
4. Grout.
5. Common communications installation requirements.

1.2 DEFINITIONS

A. EPDM: Ethylene-propylene-diene terpolymer rubber.

B. NBR: Acrylonitrile-butadiene rubber.

1.3 SUBMITTALS

A. Product Data: For sleeve seals.

1.4 COORDINATION

A. Coordinate arrangement, mounting, and support of communications equipment:

1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
3. To allow right of way for pathways installed at required slope.
4. Ensure connecting pathways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.

B. Coordinate installation of required supporting devices in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

C. Coordinate location of access panels and doors for communications items that are behind finished surfaces or otherwise concealed.

D. Coordinate selection and application of Firestopping specified in Division 07 Section "Through-Penetration Firestop Systems."

PART 2 - PRODUCTS

2.1 SLEEVES FOR PATHWAYS AND CABLES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

B. Cast-Iron Pipe Sleeves:
Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

C. Sleeves for Rectangular Openings: Galvanized sheet steel.

1. Minimum Metal Thickness:

a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and no side more than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).

b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches (1270 mm) and 1 or more sides equal to, or more than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.2 SLEEVE SEALS

A. Description:
Modular sealing device, designed for field assembly, to fill annular space between sleeve and pathway or cable.

1. Basis of Design Product:
Subject to compliance with requirements, provide or/a comparable product by one of the following:

a. Advance Products & Systems, Inc.

b. Calpico, Inc.

c. Metraflex Co.

d. Pipeline Seal and Insulator, Inc.

2. Sealing Elements:
EPDM interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of pathway or cable.

3. Pressure Plates: Stainless steel. Include two for each sealing element.

4. Connecting Bolts and Nuts:
Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.3 GROUT

A. Nonmetallic, Shrinkage Resistant Grout:

ASTM C 1107, factory packaged, nonmetallic aggregate grout, noncorrosive, non-staining, mixed with water to consistency suitable for application and a 30-minute working time.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR COMMUNICATIONS INSTALLATION

A. Comply with NECA 1.

B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall mounting items.

C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

D. Equipment:
Install to facilitate service, maintenance, and repair or replacement of components of both communications equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

E. Right of Way: Give to piping systems installed at a required slope.

3.2 SLEEVE INSTALLATION FOR COMMUNICATIONS PENETRATIONS

A. Communications penetrations occur when pathways, cables, wireways, or cable trays penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.

B. Concrete Slabs and Walls:

C. Install sleeves for penetrations unless core drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

D. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

E. Fire Rated Assemblies:

F. Install sleeves for penetrations of fire rated floor and wall assemblies unless openings compatible with fire stop system used are fabricated during construction of floor or wall.

G. Cut sleeves to length for mounting flush with both surfaces of walls.

H. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level.

I. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pathway or cable, unless indicated otherwise.

J. Seal space outside of sleeves with grout for penetrations of concrete and masomy

1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.

3.3 INTERIOR PENETRATIONS OF NON-FIRE RATED WALLS AND FLOORS:

A. Seal annular space between sleeve and pathway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants.".

END OF SECTION

SECTION 270526 – GROUNDING & BONDING FOR COMMUNICATION SYSTEMS

GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19A & 20 KONGENS GADE, ST.THOMAS, UNITED STATES VIRGIN ISLANDS

PART 1 GENERAL

1.1 TELECOMMUNICATIONS SERVICE ENTRANCE FACILITIES

A. Access to the telecommunications grounding system specified by ANSI/TIA/EIA-607-A is mandatory.

B. Main Telecommunications Equipment Rooms

1. Access shall be made available to the telecommunications grounding system specified by ANSI/TIA/EIA – 607 - Commercial Building Grounding and Bonding Requirements for Telecommunications.

1.2 GROUNDING AND BONDING

A. The National Electrical Code (NEC) provides grounding, bonding, and electrical protection requirements to ensure life safety. Modern telecommunications systems require an effective grounding infrastructure to ensure optimum performance of the wide variety of electronic information transport systems that may be used throughout the life of a building. The grounding and bonding requirements of ANSI/TIA/EIA-607 are intended to work in concert with the cabling topology specified in ANSI/TIA/EIA-568 and installed in pathways and spaces as specified in ANSI/TIA/EIA-569. The requirements of these standards, and of this manual, are in addition to the requirements of the NEC.

B. Conduits for Backbone and Horizontal Cabling Pathways shall be bonded to the grounding electrode system per the NEC.

C. All conduits shall be bonded to the grounding system as per NEC.

D. Telecommunications grounding, bonding, and electrical protection at Territory facilities shall comply with the requirement of the NEC, ANSI/TIA/EIA-607, and the additional requirements stated herein.

E. Telecommunications Main Grounding Busbar (TMGB)

1. The TMGB shall be installed at an accessible and convenient location in each Entrance Facility.

2. The TMGB shall be a pre-drilled copper busbar with standard NEMA bolt hole sizing and spacing. The busbar shall be ¼-inch thick x 4-inch wide, with length sized to accommodate ground connection of telecommunications racks, equipment, and shielded cables in the room, plus provision for 30% growth.

3. The TMGB shall be bonded to the building main electrical service-grounding electrode. No other grounding point for the TMGB shall be allowed. The TMGB shall not be bonded independently to water pipe, structural steel or electrical conduit.

F. Equipment Racks, Equipment Cabinets and Cable Ladder Racks

1. Equipment racks, equipment cabinets, cable ladder racks and exposed non-current carrying metal parts of the telecommunications Structured Cabling System shall bonded to the TMGB or TGB.

2. Each section of a cable ladder rack or tray, shall be bonded together by one of three ways:

   a. Remove paint down to bear metal at the point where the rack section interconnection hardware is mounted. Bond the rack assembly to the TMGB or TGB with a #6 AWG ground wire unless noted otherwise.

   b. Bond individual rack sections together using braided metal bonding straps or #6 AWG ground wires. The straps or ground wire shall be attached with bolts through holes drilled in the cable rack sections. The bolts must contact bear metal on the rack sections. Bond the rack assembly to the TMGB or TGB with a #6 AWG ground wire unless noted otherwise.

   c. Bond individual rack sections to a #6 AWG ground cable unless noted otherwise run throughout the entire length of rack. The ground cable shall be bonded to the TMGB or TGB.

G. Grounding and Bonding of Backbone Cables

   a. OSP copper backbone cables shall have the metallic cable shields bonded to the ground lug of the primary protector block at the entrance to each building.

   b. Optical fiber cables that contain metallic shielding or metallic strength members must have those metallic components bonded to the TMGB at each end of the cable.

   c. Inside plant copper or optical fiber backbone cables that contain metallic shielding shall have their shields bonded to the TMGB at each end.

   d. The metallic shield of splices made to backbone cables shall be bonded together to maintain shield continuity.

PART 2 PRODUCTS

2.1 TELECOMMUNICATIONS SERVICE ENTRANCE FACILITIES

A. GROUNDING AND BONDING

1. Service Entrance TMGB

   a. Provide a bond with a minimum of a # 6 AWG unless noted otherwise, green insulated ground wire from the TMGB to the main electrical service building ground.

   b. Label grounding and bonding hardware and connections per ANSI/TIA/EIA 606-A.

c. The ground busbar assembly shall be copper, 1/4" x 4" x 23" with insulators and support bracket. Provide lugs for each Bonding Conductor (BC) and the Telecommunications Bonding Backbone (TBB). Hardware (bolts) shall be silicone bronze and lugs shall be copper alloy sized for connecting the BC and TBB to the TMGB and TGB.

d. Rack mounted equipment ground busbar shall be 3/16" x ¾" x 18 5/16" for attachment to 19" mounting rails of equipment racks and cabinets. Provide splice plates for attachment to multiple equipment racks and cabinets, #6-32 silicon bronze screws, ground lugs and mounting hardware.

2.2 MAIN TELECOMMUNICATIONS EQUIPMENT ROOMS

A. GROUNDING AND BONDING

1. The TGB shall be bonded to the Main Electrical service building ground by means of a # 6 AWG unless noted otherwise, green insulated ground wire.

2. Label grounding and bonding hardware and connections per ANSI/TIA/EIA 606A.

3. The ground busbar assembly shall be copper, 1/4" x 4" x 13.5" with insulators and support bracket. Provide lugs for each BC and the TBB. Hardware (bolts) shall be silicone bronze and lugs shall be copper alloy sized for connecting the BC and TBB to the TMGB and TGB.

4. Rack mounted equipment ground busbar shall be 3/16" x ¾" x 18 5/16" for attachment to 19" mounting rails of equipment racks and cabinets. Provide splice plates for attachment to multiple equipment racks and cabinets, #6-32 silicon bronze screws, ground lugs and mounting hardware.

2.3 ADMINISTRATION AND LABELING

A. The BC shall be provided with a self-adhesive, self-laminating, mechanically printed label with a clear protective laminating over wrap or mechanically printed heat shrink tubing. The label shall be approved by the BIT/RCDD prior to application.

B. The TGB and TMGB shall be provided with a copper, brass or 1/16" mechanically stamped tag, 3" square surface area minimum, legible and permanently affixed. The tag shall be approved by the BIT/RCDD prior to application.

2.4 GROUNDING

A. Comply with requirements in Division 16 Section 16450 for grounding conductors and connectors.

B. Telecommunications Main Bus Bar:

1. Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt copper alloy lugs for connection to ground bus bar.

2. Ground Bus Bar: Copper, minimum 1/4-inch-thick by 4 inches wide with 9/32-inch holes spaced 1-1/8 inches apart.

3. Stand-Off Insulators: Comply with UL 891 for use in switchboards, 600 V. Lexan or PVC, impulse tested at 5000 V.

C. Comply with ANSI-J-STD-607-A.

D. Label grounding and bonding hardware and connections per ANSI/TIA/EIA-606-A.

PART 3 EXECUTION

3.1 TELECOMMUNICATIONS SERVICE ENTRANCE FACILITIES

A. GROUNDING AND BONDING

1. The LVLTC shall install the grounding busbar as required by ANSI/TIA/EIA 607-A and the NEC.

2. Equipment racks, conduits, cable trays, ladder racks, etc. shall be bonded to the grounding busbar.

3. Bonding connectors and clamps shall be mechanical type made of silicon bronze.

4. Terminals shall be solderless compression type, copper long-barrel NEMA two bolts.

5. The LVLTC shall bond the shield of shielded cables to the grounding busbar per applicable code and manufacturers recommended practices.

6. Grounding and bonding shall be in accordance with ANSI/TIA/EIA-607-A and the NEC.

7. Labeling shall be in accordance with ANSI/TIA/EIA 606-A.

3.2 GROUNDING

A. Install grounding according to the BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.

B. Comply with ANSI-J-STD-607-A.

C. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall allowing at least 2-inch clearance behind the grounding bus bar. Connect grounding bus bar with a minimum No. 3/0 AWG grounding electrode conductor from grounding bus bar to suitable electrical building ground.

D. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.

1. Bond the shield of shielded cable to the grounding bus bar in communications rooms and spaces.

3.3 ADMINISTRATION AND LABELING

A. The LVLTC shall permanently secure the label within six (6) inches from both ends of the BC.

B. The LVLTC shall permanently secure the tag within six (6) inches from the TMGB and TGB.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Metal conduits and fittings.
2. Nonmetallic conduits and fittings.
3. Optical-fiber-cable pathways and fittings.
4. Metal wire ways and auxiliary gutters.
5. Nonmetallic wire ways and auxiliary gutters.
6. Surface pathways.
7. Boxes, enclosures, and cabinets.
8. Hand holes and boxes for exterior underground cabling.

B. Related Requirements:

1. Section 260543 "Underground Ducts and Raceways for Electrical Systems" for exterior duct banks, manholes, and underground utility construction.
2. Section 260533 "Raceways and Boxes for Electrical Systems" for conduits, wire ways, surface raceways, boxes, enclosures, cabinets, hand holes, and faceplate adapters serving electrical systems.
3. Section 280528 "Pathways for Electronic Safety and Security" for conduits, surface pathways, inner duct, boxes, and faceplate adapters serving electronic safety and security.
4. Rooms used for telecommunications, including Service Entrance Facilities (SEF), the Main Equipment Rooms (MER), and Telecommunication Rooms (TR) shall be dedicated to the sole use of Telecommunications. No other building facility equipment shall be housed in rooms used for telecommunications including, but not limited to, fire alarm systems, monitoring systems, security systems, janitorial services, supply storage, departmental storage, etc.

1.3 DEFINITIONS

A. ARC: Aluminum rigid conduit

B. GRC: Galvanized rigid steel conduit

C. IMC: Intermediate metal conduit

1.4 ACTION SUBMITTALS

A. Product Data: For surface pathways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets

B. LEED Submittals

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings:

B. Pathway routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:

1. Structural members in paths of pathway groups with common supports

2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports

C. Qualification Data: For professional engineer.

D. Source quality-control reports.

1.6 MAIN TELECOMMUNICATIONS EQUIPMENT ROOMS

A. The Equipment Room shall be connected to the backbone pathway for cabling to the Telecommunications Entrance Facility and the Telecommunications Rooms.

1.7 BACKBONE PATHWAYS

A. The TRs shall have vertical 4" ID minimum conduit sleeved holes to the TR above provided by Division 26. Each TR shall have 4" sleeves provided by Division 26 between them. If the TRs are offset, multiple 4" conduits between them shall be provided by Division 26. An extra minimum 1-inch metallic sleeve shall be provided by Division 26 for the vertical riser ground system.

B. Sleeves provided by Division 26 will extend below the ceiling and above the floor 4" with a 2" clearance from the finished wall.

C. Firestop material shall be installed in sleeves.

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

A. Manufacturers:
Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AFC Cable Systems, Inc.

2. Allied Tube & Conduit; a Tyco International Ltd. Co.

3. Alpha Wire Company

4. Anamet Electrical, Inc.

5. Electri-Flex Company

6. 0-ZJGedney; a brand of EGS Electrical Group

7. Republic Conduit

8. Southwire Company

9. Thomas & Betts Corporation

10. Western Tube and Conduit Corporation

11. Wheatland Tube Company; a division of John Maneely Company

B. General Requirements for Metal Conduits and Fittings:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2. Comply with TIA-569-B.

C. GRC: Comply with ANSI C80.1 and UL 6.

D. ARC: Comply with ANSI C80.5 and UL 6A.

E. IMC: Comply with ANSI C80.6 and UL 1242.

F. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit

1. Comply with NEMA RN 1.

2. Coating Thickness: 0.040 inch (l mm), minimum

G. EMT: Comply with ANSI C80.3 and UL 797.

H. Fittings for Metal Conduit: Comply with NEMA FB I and UL 514B.

1. Fittings for EMT:

a. Material: Steel

b. Type: Setscrew or compression

2. Expansion Fittings:
PVC or steel to match conduit type, complying with UL-467, rated for environmental conditions where installed, and including flexible external bonding jumper.

3. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch (1 mm), width

I. Joint Compound for IMC, GRC, or ARC:
Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS AND FITTINGS

A. Manufacturers:
Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AFC Cable Systems, Inc.
2. Allied Tube & Conduit; a Tyco International Ltd. Co.
3. Anamet Electrical, Inc.
4. Arnco Corporation
5. CANTEX Inc.
6. CertainTeed Corp.
7. Condux International, Inc.
8. Electri-Flex Company
9. Kraloy
10. Lamson & Sessions; Carlon Electrical Products
11. Niedax-Kleinhuis USA, Inc.
12. RACO; a Hubbell company
13. Thomas & Betts Corporation

B. General Requirements for Nonmetallic Conduits and Fittings:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Comply with TIA-569-B.

C. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.

D. Rigid HDPE: Comply with UL 651A.

E. RTRC: Comply with UL 1684A and NEMA TC 14.

F. Fittings for RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.

G. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

H. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small Scale Environmental Chambers."

2.3 OPTICAL-FIBER-CABLE PATHWAYS AND FITTINGS

A. Manufacturers:
Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Alpha Wire Company.

2. Arnco Corporation.

3. Endot Industries Inc.

4. IPEX.

B. Description:
Comply with UL 2024; flexible type pathway, approved for plenum installation unless otherwise indicated.

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2. Comply with TIA-569-B.

2.4 METAL WIREWAYS AND AUXILIARY GUTTERS

A. Manufacturers:
Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Cooper B-Line, Inc.

2. Hoffman; a Pentair company

3. Mono-Systems, Inc.

4. Square D; a brand of Schneider Electric

B. Description:
Sheet metal, complying with UL 870 and NEMA 250, Type 1 unless otherwise indicated, and sized according to NFPA 70.

1. Metal wire ways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2. Comply with TIA-569-B.

C. Fittings and Accessories:
Include covers, couplings, offsets, elbows, expansion joints, adapters, hold down straps, end caps, and other fittings to match and mate with wire ways as required for complete system.

D. Wire way Covers: Hinged type unless otherwise indicated

E. Finish: Manufacturer's standard enamel finish.

2.5 NONMETALLIC WIREWAYS AND AUXILIARY GUTTERS

A. Manufacturers:
Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Allied Moulded Products, Inc.

2. Hoffman; a Pentair company

3. Lamson & Sessions; Carlon Electrical Products

4. Niedax-Kieinhuis USA, Inc.

B. General Requirements for Nonmetallic Wireways and Auxiliary Gutters:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2. Comply with TIA-569-B.

C. Description:
PVC, extruded and fabricated to required size and shape, and having snap-on cover, mechanically coupled connections, and plastic fasteners.

D. Fittings and Accessories:
Couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings shall match and mate with wireways as required for complete system.

E. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

F. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small Scale Environmental Chambers."

2.6 SURFACE PATHWAYS

A. General Requirements for Surface Pathways:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2. Comply with TIA-569-B.

B. Surface Metal Pathways:
Galvanized steel with snap-on covers complying with UL 5. Prime coated, ready for field painting.

1. Manufacturers:
Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Mono-Systems, Inc.

b. Niedax-Kleinhuis USA, Inc.

c. Panduit Corp

d. Wiremold *I* Legrand

C. Surface Nonmetallic Pathways:
Two- or three-piece construction, complying with UL 5A, and manufactured of rigid PVC with texture and color selected by Owner's Representative from manufacturer's standard colors. Product shall comply with UL-94 V-0 requirements for self-extinguishing characteristics.

1. Manufacturers:
Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Hubbell Incorporated; Wiring Device-Kellems Division

b. Lamson & Sessions; Carlon Electrical Products

c. Mono-Systems, Inc.

d. Panduit Corp.

e. Wiremold / Legrand

2.7 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers:
Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Adalet

2. Cooper Technologies Company; Cooper Crouse-Hinds

3. EGSI Appleton Electric

4. Erickson Electrical Equipment Company

5. Hoffman; a Pentair company

6. Hubbell Incorporated; Killark Division

7. Lamson & Sessions; Carlon Electrical Products

8. Milbank Manufacturing Co.

9. Molex; Woodhead Brand

10. Mono-Systems, Inc.

11. 0-ZJGedney; a brand of EGS Electrical Group

12. RACO; a Hubbell company

13. Robroy Industries

14. Spring City Electrical Manufacturing Company

15. Stahlin Non-Metallic Enclosures; a division of Robroy Industries

16. Thomas & Betts Corporation

17. Wiremold / Legrand

B. General Requirements for Boxes, Enclosures, and Cabinets:

1. Comply with TIA-569-B.

2. Boxes, enclosures and cabinets installed in wet locations shall be listed for use in wet locations.

C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

D. Cast Metal Outlet and Device Boxes: Comply with NEMA FB 1, aluminum, Type FD, with gasketed cover.

E. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

F. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1

G. Cast-Metal Access, Pull, and Junction Boxes:
Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.

H. Device Box Dimensions: 4 inches square by 2-1/8 inches deep (100 mm square by 60 mm deep)

I. Gangable boxes are prohibited.

J. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.

K. Hinged Cover Enclosures:
Comply with UL 50 and NEMA 250, Type 1 with continuous hinge cover with flush latch unless otherwise indicated.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel

2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

L. Cabinets:

1. NEMA 250, Type 1, galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.

2. Hinged door in front cover with flush latch and concealed hinge

3. Key latch to match panelboards.

4. Metal barriers to separate wiring of different systems and voltage.

5. Accessory feet where required for freestanding equipment

2.8 LADDER RACK

A. Provide ladder rack and stand-offs for support of backbone cables passing vertically through TRs.

B. Include connecting hardware and support hardware for a complete installation including, but not limited to, equipment rack to runway mounting plates, wall angle support brackets, butt splice swivels, junction splice connections and grounding kits.

C. Ladder Rack:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Cooper B-Line, Inc.

b. Ortronics, Inc.

c. Siemon Co.

d. Panduit Corp.

e. Hubbell

f. CommScope, Inc

g. Leviton

2. Ladder Rack Materials: Types 304 and 316 stainless steel. Ladder rack shall be a tubular side bar type nominally 3/8" thick by 1-1/2" high (Minimum) with 1/2" x 1" welded rings spaced 9" on center.

   a. Ladder Racks: Nominally 18 inches wide, and a rung spacing of 9 inches.

2.9 STRUCTURED CABLING (HORIZONTAL) SUPPORTS

A. Metallic J-hooks may be used for this project.

B. Cable Support: NRTL labeled. Cable support brackets shall be designed to prevent degradation of cable performance and pinch points that could damage cable. Cable ties are not allowed.

1. Comply with NFPA 70 and UL 2043 for fire-resistant and low-smoke-producing characteristics.

2. Adjustable cable supports, plenum rated.

PART 3 - EXECUTION

3.1 PATHWAY APPLICATION

A. Indoors: Apply pathway products as specified below unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMT

2. Exposed, Not Subject to Severe Physical Damage: EMT

3. Exposed and Subject to Severe Physical Damage: GRC. Pathway locations include the following:

   a. Loading dock

   b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units

   c. Mechanical rooms

   d. Gymnasiums

1. Concealed in Ceilings and Interior Walls and Partitions: EMT

2. Damp or Wet Locations: GRC

3. Pathways for Optical Fiber or Communications Cable in Spaces Used for Environmental Air: EMT

4. Pathways for Optical-Fiber or Communications-Cable Risers in Vertical Shafts: EMT

5. Pathways for Concealed General-Purpose Distribution of Optical-Fiber or Communications Cable: EMT

6. Boxes and Enclosures:

NEMA 250 Type I, except use NEMA 250 Type 4 nonmetallic in institutional and damp or wet locations.

B. Minimum Pathway Size: l-inch (27-mm) trade size. Minimum size for optical fiber cables is 1 inch (27 mm).

C. Pathway Fittings: Compatible with pathways and suitable for use and location

1. Rigid and Intermediate Steel Conduit:
Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.

2. PVC Externally Coated, Rigid Steel Conduits:
Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.

3. EMT: Use setscrew or compression, steel fittings. Comply with NEMA FB 2.10.

D. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

E. Install surface pathways only where indicated on Drawings.

F. Do not install nonmetallic-conduit where ambient temperature exceeds 120°F (49°C).

3.2 INSTALLATION

A. Comply with NECA 1, NECA 101, and TIA-569-B for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum pathways. Comply with NFPA 70 limitations for types of pathways allowed in specific occupancies and number of floors.

B. Keep pathways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal pathway runs above water and steam piping.

C. Complete pathway installation before starting conductor installation.

D. Install no more than the equivalent of two 90-degree bends in any pathway run. Support within 12 inches (300 mm) of changes in direction. Utilize long radius ells for all optical fiber cables.

E. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

F. Support conduit within 12 inches (300 mm) of enclosures to which attached.

G. Stub-ups to Above Recessed Ceilings:

1. Use EMT, IMC, or RMC for pathways.

2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

H. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions:

I. Apply listed compound to threads of pathway and fittings before making up joints. Follow compound manufacturer's written instructions.

J. Coat field cut threads on PVC coated pathway with a corrosion preventing conductive compound prior to assembly.

K. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install insulated bushings on conduits terminated with locknuts.

L. Install pathways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

M. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.

N. Cut conduit perpendicular to the length.

O. Install pull wires in empty pathways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire. Cap underground pathways designated as spare above grade alongside pathways in use.

P. Surface Pathways:

1. Install surface pathway for surface telecommunications outlet boxes only where shown on Drawings.

2. Install surface pathway with a minimum 2-inch (50-mm) radius control at bend points.

3. Secure surface pathway with screws or other anchor-type devices at intervals not exceeding 48 inches (1200 mm) and with no less than two supports per straight pathway section. Support surface pathway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

Q. Pathways for Optical Fiber and Communications Cable: Install pathways, metal and nonmetallic, rigid and flexible, as follows:

1. 3/4-Inch (21-mm) Trade Size and Smaller: Install pathways in maximum lengths of 50 feet (15m).

2. Install with a maximum of two 90-degree bends or equivalent for each length of pathway unless Drawings show stricter requirements. Separate lengths with pull or junction boxes or terminations at distribution frames or cabinets where necessary to comply with these requirements.

R. Install pathway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed pathways, install each fitting in a flush steel box with a blank cover plate having a finish like that of adjacent plates or surfaces. Install pathway sealing fittings according to NFPA 70.

S. Install devices to seal pathway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all pathways at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.

2. Where an underground service pathway enters a building or structure.

3. Where otherwise required by NFPA 70.

T. Comply with manufacturer's written instructions for solvent welding PVC conduit and fittings.

U. Mount boxes at heights shown on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to top of box unless otherwise indicated.

V. Horizontally separate boxes mounted on opposite sides of walls, so they are not in the same vertical channel.

W. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

X. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

3.3 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR COMMUNICATIONS PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 270544 "Sleeves and Sleeve Seals for Communications Pathways and Cabling."

3.4 PROTECTION

A. Protect coatings, finishes, and cabinets from damage or deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

3.5 LADDER RACK

A. Install at 84" AFF per manufacturer's recommendations and secured to the top of equipment racks.

B. The ladder rack shall be supported at three-foot intervals with triangular support brackets from the walls and securely attached to the equipment.

C. Cable radius waterfalls shall be attached to the ladder rack to maintain cable bending radius where cables enter and exit the ladder rack.

D. Cable shall be secured to the ladder rack using reusable Velcro type cable ties to arrange cables in logical bundles.

E. Telecommunications grounding and bonding shall be in accordance with applicable codes and regulations. Comply with ANSI/TIA/EIA-607-A and the NEC.

F. Comply with requirements for demarcation point, pathways, cabinets, and racks specified in Division 27 Section "Communications Equipment Room Fittings." Drawings indicate general arrangement of pathways and fittings.

G. Ladder racks shall comply with NEMA VE2 and ANSI/TIA/EIA 569-B.

3.6 VERTICAL LADDER RACKS

A. Vertical ladder rack shall be installed by the LVLTC.

B. The vertical ladder rack shall be installed on the wall above/below sleeves from the floor to the ceiling above. Stand offs shall be installed as necessary to support the required ladder rack. The anchoring system provided shall be suitable for the type of wall and the weight to be supported by the ladder rack.

3.7 STRUCTURED CABLING (HORIZONTAL) SUPPORTS

A. Metallic J-hooks may be used for this project.

B. Provide adjustable cable supports for the structured cabling on 30-inch centers maximum.

C. Provide Velcro type tie wraps for the structured cabling.

D. The adjustable cable supports shall be rated to carry Category 6 cabling and sized not to exceed the manufacturer's recommended quantity of cables.

END OF SECTION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. General provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Pathways.
2. UTP cabling.
3. Cable connecting hardware, patch panels, and cross-connects.
4. Telecommunications outlet/connectors.
5. Cabling system identification products.
6. Cable management system.

B. Related Sections:

1. Division 27 Section "Communications Backbone Cabling" for voice and data cabling associated with system panels and devices.

1.3 DEFINITIONS

A. BICSI: Building Industry Consulting Service International.

B. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.

C. EMI: Electromagnetic interference.

D. IDC: Insulation displacement connector.

E. LAN: Local area network.

F. Outlet/Connectors: A connecting device in the work area on which horizontal cable or outlet cable terminates.

G. RCDD: Registered Communications Distribution Designer.

H. UTP: Unshielded twisted pair.

1.4 HORIZONTAL CABLING DESCRIPTION

A. Horizontal cable and its connecting hardware provide the means of transporting signals between the telecommunications outlet/connector and the horizontal cross-connect located in the communications equipment room. This cabling and its connecting hardware are called "permanent link," a term that is used in the testing protocols.

1. ANSI/TIA/EIA-568-B.1 requires that a minimum of two telecommunications outlet/connectors be installed for each work area.

2. Horizontal cabling shall contain no more that one transition point or consolidation point between the horizontal cross-connect and the telecommunications outlet/connector.

3. Bridged taps and splices shall not be installed in the horizontal cabling.

4. Splitters shall not be installed as part of the optical fiber cabling.

B. A work area is approximately 100 sq. ft. and includes the components that extend from the telecommunications outlet/connectors to the station equipment.

C. The maximum allowable horizontal cable length is 250 feet. This maximum allowable length does not include an allowance for the length of 16 feet to the workstation equipment. The maximum allowable length does not include an allowance for the length of 16 feet in the horizontal cross-connect.

1.5 PERFORMANCE REQUIREMENTS

A. General Performance: Horizontal cabling system shall comply with transmission standards in ANSI/TIA/EIA-568-B.1, when tested according to test procedures of this standard.

1.6 SUBMITTALS

A. Product Data: For each type of product indicated.

1. For UTP cable, include the following installation data for each type used:

a. Nominal OD.

b. Minimum bending radius.

c. Maximum pulling tension.

B. Shop Drawings:

1. System Labeling Schedules: Electronic copy of labeling schedules, in software and format selected by Owner.

2. System Labeling Schedules: Electronic copy of labeling schedules that are part of the cabling and asset identification system of the software.

3. Cabling administration drawings and printouts.

4. Cabling diagrams to show typical cabling schematics, including the following:

a. Cross-connects.

b. Patch panels.

c. Patch cables.

5. Cross-connects and patch panels. Detail mounting assemblies and show elevations and physical relationship between the installed components.

C. Samples: For workstation outlets, jacks, jack assemblies, in specified finish, one for each size and outlet configuration and faceplates for color selection and evaluation of technical features.

D. Qualification Data: For Installer, layout technician, installation supervisor, and field inspector.

E. Source quality-control reports.

F. Field quality-control reports.

G. Maintenance Data: For splices and connectors to include in maintenance manuals.

H. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.

2. Program Software Backup: On magnetic media or compact disk, complete with data files.

3. Device address list.

4. Printout of software application and graphic screens.

1.7 QUALITY ASSURANCE

A. Testing Agency Qualifications: An NRTL.

1. Testing Agency's Field Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.

B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.

2. Smoke-Developed Index: 50 or less.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Test cables upon receipt at Project site.

1. Test each pair of UTP cable for open and short circuits.

1.9 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install cables and connecting materials until wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.10 COORDINATION

A. Coordinate layout and installation of telecommunications pathways and cabling with BIT/RCDD and the Agency Representative.

B. Coordinate telecommunications outlet/connector locations with location of power receptacles at each work area.

1.11 SOFTWARE SERVICE AGREEMENT

A. Technical Support: Beginning with Substantial Completion, provide software support for two years.

B. Upgrade Service: Update software to latest version at Project completion. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system. Upgrade shall include new or revised licenses for use of software.

1. Provide 30 days' notice to Owner to allow scheduling and access to system and to allow Owner to upgrade computer equipment if necessary.

1.12 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Patch-Panel Units: 10% of each type.

2. Connecting Jacks: 10% of each type.

3. Device Plates: 10% of each type.

PART 2 PRODUCTS

2.1 UTP CABLE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Berk-Tek; a Nexans company.

2. ADC

3. Siemon Co.

4. Mohawk

5. Belden

6. CommScope, Inc

B. Description: 100-ohm, 4-pair UTP, 250 MHz certified cable, covered with a **Blue** thermoplastic jacket or as directed by the US Virgin Islands RCDD.

1. Comply with ICEA S-90-661 for mechanical properties.

2. Comply with ANSI/TIA/EIA-568-B.1 for performance specifications.

3. Comply with ANSI/TIA/EIA-568-B.2, Category 6.

4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:

a. Communications, Plenum Rated: Type CMP.

2.2 UTP CABLE HARDWARE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Hubbell

2. Siemon Co.

3. ADC

4. Ortronics, Inc.

5. Panduit

6. Leviton

7. CommScope, Inc

B. General Requirements for Cable Connecting Hardware: Comply with ANSI/TIA/EIA-568-B.2, IDC type, with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher.

C. Connecting Jack: 110-style IDC rated for Category 6. Integral with connector bodies, including plugs and jacks where indicated.

D. Cross-Connect: Modular array of connecting blocks arranged to terminate building cables and permit interconnection between cables.

1. Number of Terminals per Field: One for each conductor in assigned cables.

E. Patch Panel: Modular panels housing multiple-numbered jack units with IDC-type connectors at each jack for permanent termination of pair groups of installed cables. Patch panels shall support labels and colored icons. Patch panels must have rear management bar for strain relief of horizontal cables. Coordinate subparagraph below with Drawings for quantity of fields.

1. Number of Jacks per Field: One for each four-pair UTP cable indicated.

F. Jacks and Jack Assemblies: Modular, color-coded, eight-position modular receptacle units with integral IDC S310-type terminals. Jacks shall be universally wired, angled, have a rear strain relief cap, and protective color-matching rubber door.

G. Patch Cables:

1. Patch cables shall be 100% factory-made and tested four-pair cables available in 10 feet lengths not to exceed 33 feet, white in color. Patch cables shall be made by the same manufacturer as the installed system to ensure a full channel warranty. Work area patch cables shall have bend-relief-compliant boots to ensure Category 6 performance. Patch cables shall have latch guards to protect against snagging and terminated with an eight-position modular plug at each end. Work area patch cables shall be provided for 100% of horizontal cables terminated.

H. (If Required) Analyzers and Supporting cable management hardware. This is the equipment that will provide the link between the network cabling system and the management software.

1. Analyzers: Must be available in multiple sizes to best fit port count per termination room. Analyzers are available in Master / Link or Standalone in both 1RU and 6RU. Expansion cards are available in multiples of 240 ports to expend the 6RU analyzer up to 1920 total ports.

2. I/O System Cables: System cables shall be used to connect the analyzers to patch panels, fiber enclosures, and sensor strips. When possible, single ended cables shall be used to eliminate excess slack. I/O cables shall be 26 AWG solid, non-plenum cables.

2.3 TELECOMMUNICATIONS OUTLET/CONNECTORS

A. Jacks: 100-ohm, balanced, twisted-pair connector; four-pair, eight-position modular. Comply with ANSI/TIA/EIA-568-B.1.

B. Workstation Outlets: Four port-connector assemblies mounted in single faceplate.

1. Plastic Faceplate: High-impact plastic. Coordinate color with Division 26 Section 26050 and Interior Designer.

2. For use with snap-in jacks accommodating any combination of UTP, optical fiber, and coaxial work area cables.

a. Flush mounting jacks, positioning the cable at a 45-degree angle.

3. Legend: Snap-in, clear-label covers and machine-printed paper inserts.

2.4 IDENTIFICATION PRODUCTS

A. Comply with ANSI/TIA/EIA-606-A and UL 969 for labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

B. Comply with requirements in Division 26 Section 26010.

2.5 CABLE MANAGEMENT SYSTEM

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

B. Description: Computer-based cable management system, with integrated database and graphic capabilities.

C. Document physical characteristics by recording the network, TIA/EIA details, and connections between equipment and cable.

D. Information shall be presented in database view, schematic plans, or technical drawings.

1. Microsoft Visio Professional or AutoCAD drawing software shall be used as drawing and schematic plans software.

E. System shall interface with the following testing and recording devices:

1. Direct upload tests from circuit testing instrument into the personal computer.

2. Direct download circuit labeling into labeling printer.

PART 3 EXECUTION

3.1 CABLING METHODS

A. Cabling Method: Install cables in raceways provided by Division 26 and adjustable cable straps except within cabinets, desks, and counters. Conceal cables except in unfinished spaces.

1. Install plenum cable in environmental air spaces, including plenum ceilings.

2. Comply with requirements for raceways and boxes specified in Division 26 Section 26050.

B. Cabling Method: Conceal conductors and cables in accessible ceilings, walls, and floors where possible.

C. Cabling within Enclosures: Bundle, lace, and train cables to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

3.2 INSTALLATION OF CABLES

A. Comply with NECA 1.

B. General Requirements for Cabling:

1. Comply with ANSI/TIA/EIA-568-B.1.

2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."

3. Install 110-style IDC termination hardware unless otherwise indicated.

4. Comply with the US Virgin Islands Telecommunications Distribution Manual.

5. Terminate conductors; no cable shall contain un-terminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.

6. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.

7. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.

8. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Install lacing bars and distribution spools.

9. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.

10. In the communications equipment room, install a 10-foot- long service loop on each end of cable.

11. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.

C. UTP Cable Installation:

1. Comply with ANSI/TIA/EIA-568-B.2.

2. Do not untwist UTP cables more than 1/2 inch from the point of termination to maintain cable geometry.

3. Do not remove more than ½ inch of jacket material.

D. Open-Cable Installation:

4. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.

5. Suspend UTP cable not in a wire way or pathway a minimum of 8 inches above ceilings by cable supports not more than 60 inches apart.

6. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.

E. Group connecting hardware for cables into separate logical fields.

F. Separation from EMI Sources:

1. Comply with BICSI TDMM and ANSI/TIA/EIA-569-A for separating structural cable from potential EMI sources, including electrical power lines and equipment.

2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:

   a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches.

   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches.

   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches.

3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:

   a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches.

   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches.

   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches.

4. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:

   a. Electrical Equipment Rating Less Than 2 kVA: No requirement.

   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches.

   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches.

5. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches.

6. Separation between Communications Cables and Fluorescent Fixtures: A minimum of 12 inches.

3.3 IDENTIFICATION

A. Identify system components, cabling, and cabling complying with ANSI/TIA/EIA-606-A. Comply with requirements for identification specified in Division 26 Section 26010.

1. Color-code cross-connect fields. Apply colors to telecommunications terminal backboards, connections, covers, and labels.

B. Using cable management system software specified in Part 2, develop Cabling Administration Drawings for system identification, testing, and management. Use unique, alphanumeric designation for each cable and label cable, jacks, connectors, and terminals to which it connects with same designation. At completion, cable and asset management software shall reflect as-built conditions.

C. Comply with requirements in Division 09 Section "Interior Painting" for painting backboards. For fire-resistant plywood, do not paint over manufacturer's label.

D. Paint and label colors for equipment identity shall comply with ANSI/TIA/EIA-606-A.

E. Cable Schedule: Post in prominent location in each equipment room. List incoming and outgoing cables and their designations, origins, and destinations. Protect with rigid frame and clear plastic cover. Furnish an electronic copy of final comprehensive schedules for Project.

F. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications rooms, backbone pathways and cables, terminal hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors. Follow convention of ANSI/TIA/EIA-606-A. Furnish electronic record of all drawings, in the latest version of AutoCad.

G. Cable and Wire Identification:

1. Label each cable within 6 inches of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.

2. Each wire connected to building-mounted devices is not required to be numbered at device if color of wire is consistent with associated wire connected and numbered within panel or cabinet.

3. Exposed Cables and Cables in Ladder Rack: Label each cable at intervals not exceeding 15 feet.

4. Label each terminal strip and screw terminal in each cabinet, rack, or panel.

a. Individually number cabling conductors connected to terminal strips, and identify each cable or cabling group being extended from a panel or cabinet to a building-mounted device shall be identified with name and number of particular device as shown.

b. Label each unit and field within distribution racks and frames.

1. Identification within Connector Fields in Equipment Rooms and Cabling Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware.

A. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in ANSI/TIA/EIA-606-A.

1. Cables use flexible vinyl or polyester that flex as cables are bent.

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Visually inspect UTP cable jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for compliance with color-coding for pin assignments and inspect cabling connections for compliance with ANSI/TIA/EIA-568-B.1.

2. Visually confirm Category 6, marking of outlets, cover plates, outlet/connectors, and patch panels.

3. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cables, and labeling of all components.

4. UTP Performance Tests:

   a. Perform the following tests according to ANSI/TIA/EIA-568-B.1 and ANSI/TIA/EIA-568-B.2:

      i. Wire map.

      ii. Length (physical vs. electrical, and length requirements).

      iii. Insertion loss.

      iv. Near-end crosstalk (NEXT) loss.

      v. Power sum near-end crosstalk (PSNEXT) loss.

      vi. Equal-level far-end crosstalk (ELFEXT).

      vii. Power sum equal-level far-end crosstalk (PSELFEXT).

      viii. Return loss.

      ix. Propagation delay.

      x. Delay skew.

5. Final Verification Tests: Perform verification tests for UTP systems after the complete communications cabling and workstation outlet/connectors are installed.

C. Document data for each measurement. Data for submittals shall be printed in a summary report that is formatted like Table 10.1 in BICSI TDMM, or transferred from the instrument to the computer, saved as text files, and printed and submitted.

D. End-to-end cabling will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

END OF SECTION

SECTION 272133 – DATA COMMUNICATIONS ACCESS POINTS

GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19A & 20 KONGENS GADE, ST.THOMAS, UNITED STATES VIRGIN ISLANDS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

B. Specifications throughout all Divisions of the Project Manual are directly applicable to this Section, and this Section is directly applicable to them, including but not limited to the following:

1. Division 07 - Penetration Fire stopping
2. Section 27 00 00 - Communications
3. Section 27 05 26 - Grounding and Bonding for Communications Systems
4. Section 27 05 28 - Pathways for Communications Systems
5. Section 27 05 43 - Underground Ducts and Raceways for Communications Systems
6. Section 27 05 53 - Identification for Low-Voltage Cables
7. Section 27 11 00 - Communications Equipment Room Fittings
8. Section 27 13 00 - Communications Backbone Cabling
9. Section 27 15 00 - Communications Horizontal Cabling

1.2 SUMMARY

A. This section specifies requirements for the design/layout, and installation of communications data outlets that are to serve IEEE 802.11 wireless access points (WAPs).

B. Wireless access point design needs to be a perimeter layout first then moving into the core of the building.

C. Wireless Design cannot be validated until a wireless spectrum survey is completed at Post-Construction.

1.3 DESIGN REQUIREMENTS

A. Coverage areas

1. All building spaces shall have coverage for currently supported Wi-Fi standards this includes 802.11a/g/n at a minimum SNR of 25dBM.
2. Coordinate with ITS during design for best indoor and outdoor locations.

B. Density of communication outlets for WAPs

1. Other typical buildings – one per 2300 gross square feet.

2. Unique requirements

a. Proper installation and mounting of WAPs in these spaces may result in WAPs with moderate to high visibility. Mounting above a hard deck ceiling or below a hard floor or in proximity to metal building components, HVAC ducts, etc. can diminish the wireless signal beyond the tolerances for a high-density deployment. Current deployments of WAPs in these types of spaces typically have WAPs visibly mounted to both the ceiling and underneath the classroom seating in box enclosures or from the walls.

b. Cabling pathways to ceiling mount WAP locations as well floor or wall locations must be planned. Pathways may require rigid conduit placed above ceiling, or in the wall.

C. Identification on drawing floor plans

1. Communications data outlets for WAPs shall have a distinct symbol on the drawings.

D. Cabling infrastructure

1. Each communications data outlet for a WAP is to be served by one (1) category 5e Orange cable terminated with an 8P8C connector.

2. Cable locations/mounting will be designed for below ceiling and flush mounted WAPs. Any exceptions, such as high-density locations, shall be approved by ITS.

3. Distance limitation of external antennae coax cable is one meter.

1.4 SUBMITTALS

A. The following submittals are due at the Pre-Construction Phase, in accordance with submittal requirements in Section 27 00 00 Communications:

1. Shop Drawings

a. Provide scaled drawings (not less than 1/8" = 1'-0") indicating location of communications outlets for the WAPs, as well as the routing of conduits and locations of all pull points (to include pull boxes, communications LB, etc.). These locations shall be coordinated with all other trades.

B. The following submittals are due Post-Construction, in accordance with the submittal requirements in Section 27 00 00 Communications:

1. Record Drawings

a. Provide scaled AutoCAD and PDF drawings (not less than 1/8" = 1'-0") indicating actual location of communications outlets for the WAPs, as well as the actual installed routing of conduits and locations of all pull points. Design or shop drawings with field notes will not be accepted.

PART 2 PRODUCTS

2.1 GENERAL

A. ITS may provide the WAPs and related equipment (POE switches, patch cables, controllers) in its scope of the project, and can provide the architects specifications for aesthetic concerns. Equipment changes frequently, so the project must get the current part numbers from ITS.

B. Typically used WAP models:

1. Cisco Aironet 3502i Access Point

2. Cisco Aironet 3502e Access Point

PART 3 EXECUTION

3.1 GENERAL

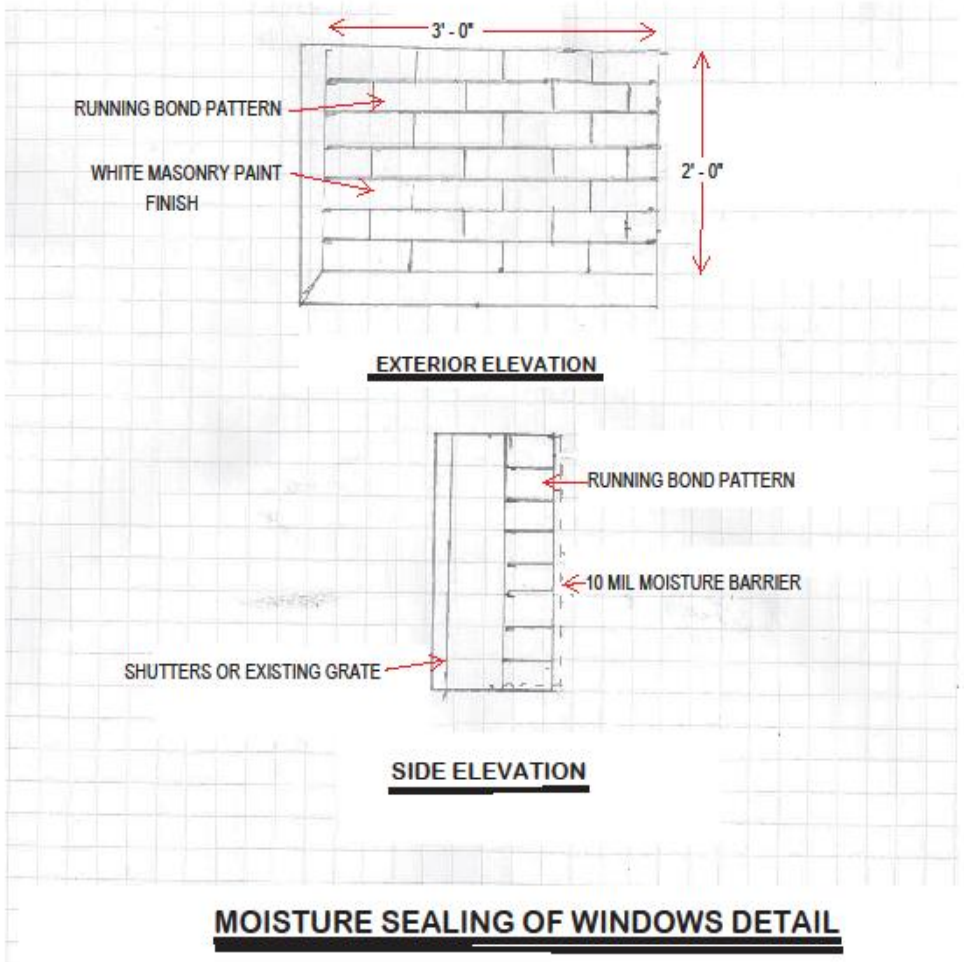
A. Contractor shall install WAPs after substantial completion (requires all cabling/mounting be installed and tested in secure communication closets).

B. WAP's shall not be mounted any higher than nine feet (Which will allow for maintenance with a five-foot ladder).

C. Wireless Spectrum Survey shall be performed after installation to validate the wireless design.

END OF SECTION

PLANS AND DETAILS
GOVERNMENT OF THE VIRGIN ISLANDS, GOVERNOR'S OFFICE
ANNEX OFFICE BUILDOUT
19A & 20 KONGENS GADE, ST.THOMAS, UNITED STATES VIRGIN ISLANDS



PLANS AND DETAILS

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